UNIVERSITAT DE BARCELONA

Evolution of the lithospheric mantle in NE Angola: implications for diamond exploration

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BY

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PUBLICATION

Castillo-Oliver, M., Galí, S., Melgarejo, J.C., Griffin, W.L., Belousova, E., Pearson, N.J., Watangua, M., O'Reilly, S.Y., 2016. Trace-element geochemistry and U-Pb dating of perovskite in kimberlites of the Lunda Norte province (NE Angola): petrogenetic and tectonic implications. Chem. Geol. doi:10.1016/j.chemgeo.2015.12.014

CHAPTER 2.
GEOLOGICAL SETTING OF THE LUNDA NORTE PROVINCE

APPENDIX

APPENDIX 2.1. General overview of the geology of Angola

A general overview of the geology of Angola and its evolution is summarised in this document, based on the information compiled by A.O. Gonçalves (2007). Therefore the reader is referred to his thesis for an exhaustive description of the Angolan geology and the corresponding.

Four Archaean shields or blocks have been identified within Angola: Maiombe, Angolan, Kasai and Bangweulo. Each one is defined by a characteristic stratigraphic sequence and was differently affected by the magmatic, metamorphic and deformation events linked to the Precambrian orogenies. As a consequence, the lithology of the Precambrian basement is complex and diverse around Angola (table A2.1a). In general terms, the crystalline Archean basement is usually divided into the *Upper Group*, composed of gneiss, plagiogneiss, quartzites and amphibolites; and the *Lower Group*, characterised by lower grade of metamorphism. During the extensional Limpopo-Liberian cycle (2700 ± 200 Ma), sedimentary rocks of different origin were deposited in the basins of the four main Angolan shields. All these rocks are nowadays totally metamorphised as a consequence of the subsequent orogenies and they occur as metaschists, metabasites, quartzites, marbles and metagreywackes.

The **Eburnean cycle** (2-2.2 Ga) is characterised by a more complex lithology than the underlying series (table A2.1b). On one side it includes the "troughs" facies, or greenstone belts, composed of thick vulcanosedimentary series developed within the tectonic depressions and only affected by a low grade metamorphism (green schist facies). These belts are divided into two main units (*Lulumba* and *Uonde Groups*) and its formation is thought to be a consequence of a collision-subduction process between the Eburnean Craton (2000Ma) and the older Chaillu (2500Ma) and Cassai (2700Ma) cratons (Bellutini et al., 1983). At the same time, thinner layers of terrigenous rocks were deposited in the regional folds. The stratigraphic sequence varies in each Archean block, but it can roughly be defined by an interbedding of conglomerate, sandstone, limestone, phyllite, schist and quartzite layers, differing in thickness. Associated with the Eburnean orogeny, several magmatic episodes took place, leading to the intrusion of the Quibala granites, the Matala red granites, porhpyritc granites, volcanic and subvolcanic rocks and dolerites.

Throughout the **Kibaran cycle** (1.4-1 Ga), the Congo craton boundary was importantly affected by extensional processes, leading to the development of thick sedimentary (carbonate and clastic) layers in the West Congo alaucogen. In the other areas, this extension was responsible for the intrusion of

basic and ultrabasic magmas. Among these, it is worth mentioning the formation of the Cunene complex in the southern part of the Angolan shield. In this anorthositic complex, the largest one in the world of its kind (15000 km^2), at least 5 kimberlitic intrusions have been described. These Proterozoic chimneys would explain the occurrence of alluvial diamonds in the southern Angolan rivers. Interestingly, the diamonds found in this area clearly differ in colour, purity, size and morphology from the ones found in north-eastern Angola (Gonçalves, 2007).

During the **Panafrican Orogeny** (˜590 My), Western Gondwana was formed as a consequence of the collision of the Congo and Brasil cratons (Alkmim et al., 2006). In the West Congo alaucogen, the sedimentary sequence corresponding to the Panafrican cycle is divided into three main series (ie. Terreiro, Alto Chiloango and Schist-carbonated Groups) as described in table A2.1c.

The **Phanerozoic** cover is composed of subhorizontal, little deformed and non-metamorphised sedimentary rocks of platform origin (table A2.1d). During the Gondwana breakup (190-60 Ma) thick and large sedimentary levels were deposited in the basins created as a result of this extension. (i.e. Karroo Fm). Also as a consequence of the Atlantic opening, oceanic margin basins started to develop, resulting in the formation of the Angolan Perioceanic Depression in the Jurassic, accompanied by a progressive deposition of marine sedimentary series. In the continent, this extensional regime triggered the development of the Lucapa corridor, as well as important basic and ultrabasic intraplate magmatic episodes within this rift. Not surprisingly, most of the alkaline, kimberlitic and carbonatitic intrusions found in Angola are known to be Cretaceous based both on stratigraphic evidences and isotope studies. Discordantly overlying these intrusions and the previously deposited materials are the *Calonda Formation* (Aptian-Albian) and the *Kalahari Group* (Paleogene-Neogene). They constitute the largest sedimentary cover in Angola and are mainly composed of polymictic conglomerates, sandstones and mudstones of continental origin.

		CRATON SHIELDS				TECTONO-MAGMATIC ACTIVITY
		Maiombe	**Angola**	**Kassai**	**Bangweulo**	
ARCHAEAN CYCLES	**Mesoarchaean** (> 3Gy)	**Upper Group:** gt-gneiss, amphibolite, green schists (low metamorphic grade)	**Upper Group:** amphibolites, bt-, ep-, st-gneisses, marble, schists	**Upper Group:** highly metamorphosed rocks, migmatites, granites	**Upper Group:** amph-gneisses, quartzites, granitoids	Gabbro-norites (2822 ± 66My), amphibolites, px-gabbros
		Lower Group: bt- and gt-gneisses, bt-pyroxenites, grt-bt amphibolites, quartzites	**Lower Group:** px-, gt- and bt-gneisses, pl-px-gneisses, granulite, gabbros, charnokite	**Lower Group:** micaschists, granulites, gneisses, amphibolites, quartzites, migmatites	-	
	Limpopo - Liberian (2700 ± 200 My)	*Matadi Fm.* (quartzites, conglomerates); *Gangila Fm.* (micaschists, metabasites); *Tchela Fm.* (quartzites, metabasites)	**Upper group:** quartzites, marbles; Lower group: micaschists	ky-quartzites, qtz-mu-schists, amphibolites	-	low metamorphism (amphibolites, green schists) + small granitoids in SW Angolan Shield and Maiombe; granitization of gneisses (2546 ± 48My)

Table A2.1a. Stratigraphy and tectonomagmatic activity in the different craton shields in Angola during the Archean cycles (2700 - >3000 Ma)

		STRATIGRAPHIC SEQUENCE			INTRUSIONS
LOWER PROTEROZOIC	Eburnean cycle (2.2-2Gy)	**Greenstone belts** (thick layers of vulcano-sedimentary rocks)	**Cassinga Supergroup** Angola Shield	*Jamba and Cuandja Groups* (greenstone belts, acid volcanic rocks, itabirites, quartzites) *Bale Group* (terrigenous deposits, quartzites, metagreywackes, metaconglomerate, phyllite, schist)	Quibala granites (2300 ± 200 Gy); S-type granitoids (1790 ± 32My, Angolan shield); Leucogranites (Angola and Maiombe Shields); Ultrabasic dykes (Maiombe Shield); gabbro dykes (Angola shield); pegmatites, microgranites, aplites and pegmatites (1753 ± 42My, 1996 ± 11My, W Angola and Maiombe Shields)
			Lucifo - Cabinda zone NW Angola	*Lulumba Fm* (volcanosedimentary, arkoses, betabasites, schists) limestones)	
		Folds regional	**Oendolongo Fm** Angola Shield	(conglomerates, sandstones, quartzites, itabirites, siltites, metaschists)	
			Lunda Cassai Shield	*Lunda Fm* (1800-2200 My; *Luana Fm* (1000-1650 My; conglomerates, greywackes, sandstones, schists)	
			Alto Zambeze Bangwelo shield	*Malombe Fm* (conglomerates, quartzites, schists, volcanoclastic rocks)	

Table A2.1b. Stratigraphy and tectonomagmatic activity in the different craton shields and greenstone belts in Angola during the Eburnean cycle (2000 - 2200 Ma)

		STRATIGRAPHIC SEQUENCE		INTRUSIONS
UPPER PROTEROZOIC	Panafrican cycle (˜580 My)	West Congo alaucogen (WCA)	*Terreiro Group* (quartzites, metagreywackes, schists, shales, conglomerates, cherts, sandstones)	pre-orogeny rift related alkaline granites (1 Gy)
			Alto Chiloango Group (detritic and carbonated rocks)	
			Carbonate-Schist Group (limestones, dolomites, schists)	
			Sandy-schist Group : *M'Pioka Fm* and *Inkisi Fm* (terrigenous, schist, conglomerates, sandstones, sitlites, greywackes)	
	Kibaran cycle (1.4-1 Gy)	Congo Plate and Lutete Depression	Lutete Depression (Between WCA and Angola Shield): *Carbonate-schist* (limestones, dolomites, siltites)	**Cunene Complex** (S Angola Shield) = *basic and ultrabasic rocks from the Cunene complex* (anortosites, gabbro-anortosites, gabbronorites, troctolites - 1470 ± 25My-, peridotites, pyroxenites) + *Matala red granites* and other acid rocks (rapakivi granites, porphyr, sienites and dolerites, 1350 ± 65 My) + **kimberlite intrusions**
			Lutete Depression (Between WCA and Angola Shield): *Sandy-shcist* (terrigenous, schist, conglomerates, sandstones, sitlites, greywackes)	
			Macondo Group (schists, limestones, mudstones)	
		Okavango Plate	*Humpata Fm* (conglomerates, breccias, quartzites, quartz sandstones, sitlites and mudstones)	
			Leba Fm (dolomites, limestones -with stromatolites-, calcarenite)	

Table A2.1c. Stratigraphy and tectonomagmatic activity in Angola during the Kibarian (1000 - 1400 Ma) and the Panafrican (˜580Ma) orogenic cycles.

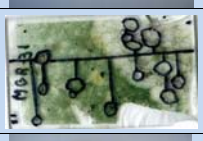
	STRATIGRAPHIC SEQUENCE			
PHANEROZOIC	**Kalahari Group** (Paleogen - Neogen)	*Polymorphic sandstones Fm.* : sandstones, conglomerates, silicified rocks *Ocher sands Fm.* (sands and clays)		
	Calonda Fm (Aptian- Albian)	polymictic conglomerates, sandstones, mudstones, intraformation conglomerates with diamonds		
	Kwango Fm (Turonian - Aptian)	sandstones, polymictic conglomerates, siltites and mudstones		
	Intercalar Continental Formation (Upper Jurassic - Lower Cretaceous)	sandstones, siltites, mudstones, conglomerates		
	Karroo Supergroup (Paleozoic-Mesozoic)	**Okavango Plate**	*Ecca Group* (Carboniferous-Permian): sandstones, conglomerates, *Stormberg Group* (Jurassic-Triassic): sandstones, basic volcanic	
		Cassai Shield	*Lutoe Group:* conglomerates interbedded with sandstones and schists	
		Congo Plate	Cassange (Permian-Triassic)	*Cassanje Group:* sandstone, mudstones, limestones -with fossils- *Lutoe Group:* conglomerate tillites interbedded with sandstones and muddy schists
			Stromberg Group (Jurassic-Triassic)	Lower: mudstones, sandstones, conglomerates, muddy schists Upper: basalts, dolerites, diabases, spilites

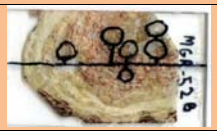
Table A2.1d. General stratigraphic sequence in Angola in the Phanerozoic.

CHAPTER 3.
METHODOLOGY

APPENDIX

Sample	Pipe	Well	Depth (m)	Units	Photo	Photo B	Description
MGR-1	Catoca	070/345	837.1	1			Clinopyroxene megacryst
MGR-2	Cat 115	7	44.8	1			highly altered clinopyroxene megacryst
MGR-3	Cat 115	8	134-140	2			Kimberlite rock, crater facies
MGR-4	Cat 115	8	140-148 dalt	2			Kimberlite rock, crater facies, with layering
MRG-5	Cat 115	8	0-148,1 ba	1			Kimberlite rock, crater facies
MRG-6A	Cat 115	18	165	1			Kimberlite rock, diatreme zone, serpentinised
MGR-6b	Cat 115	8	153.3	7			Kimberlite rock, diatreme zone, serpentinised, with abundant garnet
MGR-10	Cat 115	14	227	5			Sheared Grt-Lherzolite
MGR-11	Cat 115	14	225.0	4			Spl-Harzburgite xenolith, kimberlitic matrix with phlogopite, garnet and ilmenite xenocrysts
MGR-12	Cat 115	14	237.7	1			Sheared Grt-Harzburgite xenolith
MGR-13	Cat 115	14	245.5	3			Grt-pyroxenite, orange garnets
MGR-14	Cat 115	14	245.8	1			Eclogite xenolith? Highly altered
MGR-15A	Cat 115	14	248.9	6			highly metasomatised xenolith: MARID? With olivine, chromite, diopside, phlogopite
MGR-18	Cat 115	18	172.4	6			olivine-gt (websterite?)
MGR-19	Cat 115	18	174.4	2			highly altered Lherzolite?

Sample	Pipe	Well	Depth (m)	Units	Photo	Photo B	Description
MGR-20a	Cat 115	18	181.5	3			Clinopyroxene megacryst
MGR-20b	Cat 115	18	181.5	3			Clinopyroxene megacryst
MGR-22	Cat 115	18	187.4	1			ilmenite nodule
MGR-23	Cat 115	18	189.2	6			highly altered lherzolite, with reaction rim between the peridotite and the kimberlite groundmass
MGR-24b	Cat 115	18	198.6	1			highly metasomatised peridotite: lherzolite? with highly altered olivine, phlogopite
MGR-24a	CAT 115	18	198.5	1			sheared Grt-Harzburgite xenolith
MGR-25	Cat 115	18	203.6	envelop			kimberlite groundmass, abundant phlogopite
MGR-27	Cat 115	18	222.4	1			highly metasomatised peridotite: amphibole, ilmenite, phlogopite, apatite
MGR-28	Cat 115	18	224.5	1			sheared Grt-harzburgite xenolith
MGR-29	Cat 115	18	225.1	1			kimberlite groundmass
MGR-30a	Cat 115	18	225.2	1			coarse Grt-lherzolite, with phlogopite
MGR-30b	CAT 115	18	226.8-1	1			coarse Grt-lherzolite, with phlogopite
MGR-31	Cat 115	18	226.8-2	1			coarse Grt-Harzburgite xenolith
MGR-32a	Cat 115	18	226.8-3	1			kimberlite groundmass, abundant garnet xenocrysts
MGR-32b	Cat 115	18	226.8-3	1			sheared Grt-Harzburgite xenolith

Sample	Pipe	Well	Depth (m)	Units	Photo	Photo B	Description
MGR-34	Cat 115	18	227.4	6			coarse Grt-Wehrlite xenolith
MGR-35	Cat 115	18	230.2-1	1			granulite?
MGR-36	Cat 115	18	230.2-2	1			large phlogopite xenocrysts with ilmenite xenocrysts in the kimberlitic groundmass
MGR-37	Cat 115	18	230.5	1			coarse Grt-Wehrlite xenolith
MGR-40a	Cat 115	18	287.4	1			Coarse harzburgite xenolith; large ilmenite xenocryst in the kimberlite
MGR-40b	Cat 115	18	287.4	1			coarse Grt-Harzburgite xenolith
MGR-42	Cat 115	18	295.5	1			highly metasomatised xenolith
MGR-43	Mulepe	1	62	1			Clinopyroxene megacryst
MGR-44	Mulepe	2	80.1	1			highly metasomatised xenolith; clinopyroxene and altered olivine with veinlets of ilmenite
48	Cat 115	8	163.5	1			ilmenite nodule
MGR-49	Cat 115	8	163.7				kimberlite matrix
MGR-50	Cat 115	8	164.5	1			ilmenite nodule
51	Catoca	Kalahari Ferricreta					Kalahari Ferricreta
MGR-52a	Catoca	KBMP					saponite nodules
MGR-52b	Catoca	KBMP					saponite nodule, with blue crystals inside (corundum?)

Sample	Pipe	Well	Depth (m)	Units	Photo	Photo B	Description
MGR-52c	Catoca	KBMP					saponite nodule
MGR-52d	Catoca	KBMP					saponite nodule, highly altered xenolith
MGR-53	Catoca	KBMP-2	-				saponite nodule
54	Catoca	KBMP-Saponita					kimberlitic breccia, with phlogopite and xenoliths with saponite
55	Catoca	TK1					volcanosedimentary tuff
56	Catoca	TK1-2					volcanosedimentary tuff
57	Catoca	VMS					volcanosedimentary tuff
58	Catoca	VS					volcanosedimentary tuff
59	Tchiuzo	1					ilmenite nodules
MGR-60a	Tchiuzo	2					ilmenite nodule + magnetic mineral
MGR-60b							ilmenite nodule
MRG-61	Tchiuzo	C-34	281.2				kimberlite matrix
62	Tchiuzo	C-34	291.8				garnet xenocyrst
64	Tchiuzo	C-37	105				nodule with pyrope
MGR-65	Tchiuzo	C-58	87.5				ilmenite nodules

A3.1. Sample catalogue

Sample	Pipe	Well	Depth (m)	Units	Photo	Photo B	Description
MGR-66	Tchiuzo	C-60	82.0				ilmenite nodules
MGR-68	Catoca	055/37	508	4			kimberlitic matrix, with ilmenite xenocrysts
CAT-18	Catoca						eclogite
CAT-26	Catoca						Grt-pyroxenite
Cat-34	Catoca						Eclogite
CAT-41	Catoca	075/340	68				eclogita
CAT-84	Catoca						clinopyroxene megacryst
CAT-86	Catoca						clinopyroxene megacryst
CAT-92	Catoca						clinopyroxene megacryst
CAT-94	Catoca						clinopyroxene megacryst
CAT-95	Catoca						clinopyroxene megacryst
Cat-97	Catoca						clinopyroxene megacryst

A3.1. Sample list for the Calonda and Mulepe kimberlites

Sample	Pipe	Well	Depth (m)	Units
EII 706	Mulepe 1	706	1	
EII 706	Mulepe 1	706	2	
EII 720	Mulepe 1	720	1	
EII 704_1	Mulepe 1	704	1	11
EII 704_2	Mulepe 1	704	2	11
EII 705_1	Mulepe 1	705	1	4
EII 705_2	Mulepe 1	705	2	4
EII 707_1	Mulepe 1	707	1	
EII 708_1	Mulepe 1	708	1	
EII 708_2	Mulepe 1	708	2	
EII 708_3	Mulepe 1	708	3?	
EII 718	Mulepe 1	718	-	2
EII 720	Mulepe 2	720	2	
EII 722_1	Mulepe 2	722	1	11
EII 723_1	Mulepe 2	723	1	10
EII 723_2	Mulepe 2	723	2	10
EII 727_1	Mulepe 2	727	1	8
EII 727_2	Mulepe 2	727	2	8
EII 728_1	Mulepe 2	728	1	10
EII 728_2	Mulepe 2	728	2	10
EII 728_3	Mulepe 2	728	3	10
EII 728_4	Mulepe 2	728	4	10
EII 816_1	Calonda	816	1	
EII 816_2	Calonda	816	2	
EII 818_1	Calonda	818	1	4
EII 820	Calonda	820	1	
EII 822	Calonda	822	1	
EII 824	Calonda	824	1	

Standards used for EMP calibration in the CCiT facilities (Universitat de Barcelona)

Element	*Standards*			*Silicates*				*Oxides*	
	line	crystal	standard	grt, opx, ol	srp	phl, amph	ilm	chr, ttn, usp	pvk
F	Kα	TAP	fluorite	-	-	x	-	-	-
Na	Kα	TAP	albite	x	x	x	-	-	x
Mg	Kα	TAP	periclase	x	x	x	x	x	-
Al	Kα	TAP	corundum	x	x	x	x	x	x
Si	Kα	TAP	diopside	x	x	x	x	x	x
Cl	Kα	PET	AgCl	-	-	x	-	-	-
K	Lα	PET	orthoclase	x	x	x	-	-	x
Ca	Kα	PET	wollastonite	x	x	x	x	x	x
Ti	Kα	PET	rutile	x	x	x	x	x	x
V	Kα	LiF	V metal	-	-	-	x	x	-
Cr	Kα	PET	Cr_2O_3	x	x	x	x	x	-
Mn	Kα	LiF	rodonite	x	x	x	x	x	-
Fe	Kα	LiF	Fe_2O_3	x	x	x	x	x	x
Ni	Kα	LiF	NiO	x	x	x	x	x	-
Zn	Kα	LiF	sphalerite	x	-	-	x	x	-
Sr	Lα	PET	Celestine	-	-	-	-	-	x
Zr	Lα	PET	ZrO_2	x	-	x	x	x	-
Nb	Lα	PET	Nb metal	x	-		x	x	x
Ba	Lα	LiF	Barite	x	-	x	-	*x*	-
La	Lα	PET	LaB_6	-	-	-	-	-	x
Ce	Lα	PET	CeO_2	-	-	-	-	-	x
Nd	Lα	LiF	Ta metal	-	-	-	-	-	x
Ta	Lα	LiF	REE4 *	-	-	-	-	-	x

* synthetic glass with 4 wt% Nd

Standards used for EMP calibration in the GAU facilities (Macquarie University)

Element	*Standards*			*Silicates*
	line	crystal	standard	grt, px, ol
Cr	Kα	LLIF	Cr_2O_3	x
Mn	Kα	LLIF	Mngarn	x
K	Kα	LPET	Orthoclase	x
Ca	Kα	LPET	Andradite	x
Si	Kα	LTAP	Andradite	x
Na	Kα	LPET	Jadeite	x
Ti	Kα	LLIF	TiO_2	x
Fe	Kα	LLIF	Fe_2O_3	x
Ni	Kα	LTAP	Ni-Olivine	x
Mg	Kα	TAP	Periclase	x
Al	Kα	TAP	kyanite	x

Appendix A3.3. Analysis of the standards used for calibration of the EMP for major-element analysis

Label	Di-1	Di-2	Di-3	Di-4	Di-5	Di-6	Di-7	Di-8	Di-9	Di-10	Average	Sigma	Nominal
O W%	44.5	44.34	44.22	44.6	44.52	44.32	44.58	44.45	44.32	44.48	44.43	0.13	
Na W%	0.29	0.31	0.3	0.32	0.27	0.29	0.32	0.31	0.34	0.34	0.31	0.02	0.28
Mg W%	10.75	10.8	10.86	10.8	10.94	10.69	10.93	10.77	10.73	10.81	10.81	0.08	10.82
Al W%	0.31	0.35	0.27	0.29	0.28	0.31	0.36	0.32	0.31	0.3	0.31	0.03	0.23
Si W%	**25.98**	**25.75**	**25.68**	**25.99**	**25.82**	**25.85**	**25.84**	**25.84**	**25.78**	**25.88**	**25.84**	**0.09**	**25.80**
K W%	0	0	0	0	0	0	0.01	0	0	0	0	0	0.00
Ca W%	18.14	18.22	18.21	18.29	18.4	18.18	18.27	18.33	18.24	18.26	18.25	0.07	18.00
Ti W%	0.02	0.01	0.02	0.02	0.03	0.03	0.03	0.02	0.03	0.02	0.02	0.01	0.01
Mn W%	0.02	0.04	0.09	0.05	0.04	0.04	0.07	0.07	0.02	0.02	0.05	0.02	0.04
Fe W%	0.62	0.65	0.55	0.64	0.62	0.6	0.64	0.63	0.65	0.66	0.63	0.03	0.69
Sum W%	100.64	100.46	100.2	101.01	100.92	100.31	101.06	100.73	100.43	100.76	100.65	0.3	100.00
Na Ox%	0.4	0.42	0.4	0.43	0.37	0.4	0.43	0.42	0.46	0.46	0.42	0.03	0.38
Mg Ox%	17.83	17.91	18	17.91	18.14	17.72	18.12	17.85	17.79	17.92	17.92	0.14	17.94
Al Ox%	0.59	0.66	0.51	0.55	0.53	0.58	0.69	0.61	0.58	0.56	0.59	0.05	0.43
Si Ox%	55.58	55.08	54.95	55.6	55.24	55.31	55.27	55.28	55.16	55.37	55.28	0.2	55.19
K Ox%	0	0	0	0	0.01	0	0.01	0	0	0	0	0	0.00
Ca Ox%	25.38	25.49	25.49	25.59	25.74	25.44	25.57	25.64	25.53	25.55	25.54	0.1	25.18
Ti Ox%	0.04	0.01	0.03	0.03	0.05	0.05	0.04	0.03	0.05	0.03	0.04	0.01	0.02
Mn Ox%	0.02	0.05	0.12	0.07	0.05	0.05	0.09	0.09	0.03	0.02	0.06	0.03	0.05
Fe Ox%	0.8	0.83	0.12	0.83	0.8	0.77	0.83	0.82	0.84	0.85	0.81	0.04	0.89
Sum Ox%	100.64	100.46	100.2	101.01	100.92	100.31	101.06	100.73	100.43	100.76	100.65	0.3	100.09

Appendix A3.3. Analysis of the standards used for calibration of the EMP for major-element analysis

Label	augite-1	augite-2	augite-3	augite-4	augite-5	augite-6	augite-7	augite-8	augite-9	augite-10	Average	Sigma	Nominal
O W%	42.88	43.21	43.17	43.19	43.11	43.04	42.89	43.16	43.09	43.11	43.09	0.12	42.45
Na W%	0.55	0.53	0.59	0.61	0.53	0.58	0.6	0.58	0.57	0.58	0.57	0.03	0.59
Mg W%	8.25	8.5	8.4	8.29	8.28	8.3	8.18	8.38	8.35	8.2	8.31	0.1	7.16
Al W%	3.95	3.78	4.02	4.14	3.76	3.98	3.94	4.04	3.99	3.99	3.96	0.11	4.77
Si W%	22.46	22.84	22.56	22.58	22.84	22.57	22.6	22.67	22.66	22.68	22.65	0.12	21.47
K W%	0	0	0	0	0	0	0	0	0	0	0	0	0.01
Ca W%	15.37	15.16	15.31	15.08	15.28	15.22	15.1	15.16	15.14	15.11	15.19	0.1	15.45
Ti W%	0.86	0.83	0.92	0.89	0.87	0.88	0.87	0.84	0.86	0.88	0.87	0.03	1.37
Mn W%	0.09	0.1	0.05	0.08	0.09	0.1	0.05	0.04	0.08	0.11	0.08	0.02	0.05
Fe W%	4.94	4.92	4.95	5.13	4.9	4.97	4.92	4.87	4.89	5.13	4.96	0.1	5.76
Sum W%	99.35	99.88	99.97	99.99	99.66	99.64	99.17	99.74	99.62	99.81	99.68	0.26	99.12
Na Ox%	0.74	0.72	0.8	0.83	0.72	0.78	0.81	0.78	0.77	0.78	0.77	0.04	0.79
Mg Ox%	13.69	14.09	13.92	13.74	13.74	13.76	13.57	13.89	13.84	13.6	13.78	0.16	11.88
Al Ox%	7.47	7.15	7.6	7.82	7.11	7.52	7.45	7.63	7.55	7.54	7.48	0.21	9.02
Si Ox%	48.05	48.86	48.27	48.31	48.85	48.29	48.35	48.51	48.47	48.53	48.45	0.25	45.93
K Ox%	0	0	0	0	0	0	0.01	0	0	0	0	0	0.01
Ca Ox%	21.51	21.21	21.42	21.1	21.38	21.29	21.13	21.22	21.18	21.15	21.26	0.14	21.62
Ti Ox%	1.43	1.39	1.54	1.49	1.45	1.46	1.46	1.4	1.43	1.47	1.45	0.04	2.29
Mn Ox%	0.12	0.13	0.06	0.1	0.11	0.13	0.07	0.06	0.1	0.14	0.1	0.03	0.07
Fe Ox%	6.35	6.34	6.37	6.6	6.31	6.39	6.33	6.26	6.29	6.61	6.38	0.12	7.42
Sum Ox%	99.35	99.88	99.97	99.99	99.66	99.64	99.17	99.74	99.62	99.81	99.68	0.26	99.11

Appendix A3.3. Analysis of the standards used for calibration of the EMP for major-element analysis

Label	Wo-1	Wo-2	Wo-3	Wo-4	Wo-5	Wo-6	Wo-7	Wo-8	Wo-9	Wo-10	Average	Sigma	Nominal
O W%	41.2	41.38	41.13	41.35	41.28	41.37	41.42	41.34	41.16	41.24	41.29	0.1	
Na W%	0.01	0	0.01	0.03	0	0	0.01	0	0.01	0.01	0.01	0.01	0.00
Mg W%	0.01	0.02	0.01	0.01	0.03	0	0.02	0.01	0.01	0.01	0.01	0.01	0.00
Al W%	0.01	0	0.02	0.01	0.01	0.01	0	0.01	0	0	0.01	0.01	0.00
Si W%	23.93	24.2	23.96	24.03	24.06	24.02	24.06	24.07	24.04	23.93	24.03	0.08	24.08
K W%	0	0	0	0	0	0.01	0	0	0	0	0	0	0.00
Ca W%	**34.61**	**34.28**	**34.37**	**34.63**	**34.44**	**34.75**	**34.8**	**34.53**	**34.15**	**34.66**	34.52	0.21	34.12
Ti W%	0	0.02	0	0.02	0	0	0.01	0.02	0.03	0	0.01	0.01	0.00
Mn W%	0.13	0.05	0.1	0.16	0.11	0.13	0.09	0.16	0.08	0.13	0.12	0.04	0.12
Fe W%	0.23	0.29	0.21	0.27	0.22	0.27	0.26	0.21	0.28	0.31	0.26	0.04	0.27
Sum W%	100.14	100.24	99.81	100.5	100.14	100.56	100.67	100.36	99.77	100.29	100.25	0.3	100.00
Na Ox%	0.01	0	0.02	0.03	0	0.01	0.01	0	0.02	0.01	0.01	0.01	
Mg Ox%	0.02	0.03	0.02	0.01	0.05	0	0.03	0.02	0.02	0.02	0.02	0.01	
Al Ox%	0.02	0	0.04	0.02	0.01	0.01	0	0.01	0	0	0.01	0.01	
Si Ox%	51.19	51.77	51.25	51.4	51.47	51.39	51.47	51.49	51.43	51.19	51.41	0.17	
K Ox%	0	0	0	0	0	0.01	0	0	0	0	0	0	
Ca Ox%	48.43	47.97	48.1	48.45	48.19	48.62	48.7	48.31	47.79	48.49	48.3	0.29	
Ti Ox%	0	0.03	0	0.03	0	0	0.01	0.04	0.05	0	0.01	0.02	
Mn Ox%	0.17	0.07	0.12	0.21	0.14	0.17	0.12	0.21	0.1	0.17	0.15	0.05	
Fe Ox%	0.3	0.37	0.27	0.35	0.29	0.35	0.34	0.27	0.37	0.4	0.33	0.05	
Sum Ox%	100.14	100.24	99.81	100.5	100.14	100.56	100.67	100.36	99.77	100.29	100.25	0.3	

Appendix A3.3. Analysis of the standards used for calibration of the EMP for major-element analysis

	Smithsonian Garnet	Smithsonian Garnet	Smithsonian Garnet	MPI Garnet	MPI Garnet	MPI Garnet	Kakanui Pyrope	Kakanui Pyrope	Kakanui Pyrope
SiO_2	39.09	39.01	39.24	39.72	39.44	39.70	41.21	41.46	41.06
Al_2O_3	21.62	21.69	21.48	22.11	22.26	22.15	22.93	22.77	23.03
MgO	6.97	6.91	6.84	11.26	11.38	11.33	19.51	19.28	19.58
Cr_2O_3	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	0.10	0.07	0.09
MnO	0.71	0.70	0.71	0.96	0.95	0.96	0.32	0.32	0.28
K_2O	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*
CaO	14.51	14.91	14.91	3.94	3.91	3.95	5.29	5.27	5.27
Na_2O	0.16	0.16	0.16	*BDL*	0.01	*BDL*	0.02	0.02	0.03
TiO_2	0.36	0.40	0.40	0.04	0.04	0.04	0.44	0.45	0.45
FeO	16.30	16.10	15.95	22.96	23.32	23.04	10.37	10.37	10.32
NiO	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*
Total	99.72	99.88	99.69	100.99	101.31	101.17	100.19	100.01	100.11
Si	18.27	18.23	18.34	18.57	18.44	18.56	19.26	19.38	19.19
Al	11.44	11.48	11.37	11.70	11.78	11.72	12.14	12.05	12.19
Mg	4.20	4.16	4.12	6.79	6.86	6.83	11.77	11.63	11.81
Cr	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	0.07	0.05	0.06
Mn	0.55	0.54	0.55	0.74	0.74	0.74	0.24	0.25	0.22
K	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*
Ca	10.37	10.66	10.66	2.82	2.80	2.82	3.78	3.77	3.77
Na	0.12	0.12	0.12	*BDL*	0.01	*BDL*	0.02	0.02	0.02
Ti	0.21	0.24	0.24	0.03	0.02	0.03	0.26	0.27	0.27
Fe	12.67	12.51	12.40	17.85	18.13	17.91	8.06	8.06	8.03
Ni	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*	*BDL*
O	41.89	41.93	41.90	42.50	42.54	42.56	44.59	44.54	44.57
Total	99.72	99.87	99.70	101.00	101.32	101.17	100.19	100.02	100.13

A3.4. Analyses of the international standard (610 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of the perovskites. Data given in ppm.

	610-01	610-02	610-03	610-04	610-05	610-06	610-07	610-08	610-09	610-10	610-11	610-12
^{23}Na	96900	97500	97900	96400	96700	97900	96500	97900	94900	100000	97500	96800
1 σ	*3100*	*3200*	*3400*	*3400*	*3200*	*3200*	*3400*	*3500*	*4000*	*4200*	*5400*	*5500*
^{25}Mg	455	455	456	454	454	457	451	460	459	452	442	465
1 σ	*15*	*15*	*15*	*15*	*16*	*16*	*18*	*18*	*21*	*21*	*27*	*29*
^{39}K	457	469	464	462	456	473	457	470	451	478	473	455
1 σ	*16*	*17*	*19*	*19*	*19*	*19*	*24*	*25*	*23*	*24*	*33*	*33*
^{42}Ca	81600	82300	81400	82400	82100	81600	81800	82000	81700	82100	82800	81300
1 σ	*2700*	*2700*	*2800*	*2800*	*2600*	*2600*	*2600*	*2600*	*2800*	*2800*	*3100*	*3000*
^{43}Ca	81900	81900	81900	81900	81900	81900	81900	81900	81900	81900	81900	81900
1 σ	*2600*	*2600*	*2600*	*2600*	*2600*	*2600*	*2600*	*2600*	*2600*	*2600*	*2600*	*2600*
^{45}Sc	449	451	451	449	450	451	448	453	447	454	452	449
1 σ	*14*	*14*	*15*	*15*	*15*	*15*	*15*	*15*	*15*	*15*	*16*	*16*
^{51}V	443	445	446	442	442	447	442	447	437	452	445	443
1 σ	*14*	*14*	*15*	*15*	*15*	*15*	*15*	*16*	*16*	*17*	*20*	*20*
^{57}Fe	461	446	442	464	455	451	447	460	454	454	429	475
1 σ	*20*	*20*	*28*	*30*	*17*	*17*	*19*	*21*	*32*	*33*	*45*	*52*
^{85}Rb	429	431	435	424	427	434	427	433	419	444	433	427
1 σ	*14*	*14*	*17*	*16*	*14*	*14*	*16*	*16*	*19*	*20*	*27*	*27*
^{86}Sr	523	527	528	522	526	523	526	524	523	523	590	470
1 σ	*17*	*17*	*18*	*18*	*17*	*17*	*17*	*17*	*63*	*64*	*130*	*110*
^{88}Sr	523	527	526	524	525	525	524	526	523	527	524	525
1 σ	*16*	*17*	*17*	*17*	*16*	*16*	*16*	*17*	*16*	*17*	*17*	*17*
^{89}Y	488	492	493	487	489	491	489	491	486	494	488	491
1 σ	*16*	*16*	*16*	*16*	*15*	*15*	*15*	*16*	*16*	*16*	*17*	*17*
^{90}Zr	490	490	492	487	489	492	489	491	485	494	523	471
1 σ	*15*	*15*	*16*	*16*	*15*	*15*	*16*	*16*	*34*	*35*	*55*	*51*
^{93}Nb	510	514	517	507	510	515	510	514	505	520	509	513
1 σ	*17*	*17*	*18*	*18*	*16*	*16*	*17*	*17*	*18*	*19*	*21*	*22*
^{137}Ba	444	448	446	446	444	449	441	451	443	449	451	442
1 σ	*14*	*14*	*15*	*15*	*15*	*16*	*17*	*18*	*15*	*15*	*18*	*17*
^{139}La	439	441	441	439	440	440	439	442	439	442	435	443
1 σ	*14*	*14*	*14*	*14*	*14*	*14*	*14*	*14*	*15*	*15*	*16*	*16*
^{140}Ce	443	449	447	445	445	448	445	448	446	446	442	449
1 σ	*14*	*14*	*15*	*15*	*14*	*14*	*14*	*14*	*14*	*14*	*15*	*15*
^{141}Pr	466	470	470	466	468	468	469	467	469	468	455	478
1 σ	*15*	*15*	*15*	*15*	*14*	*14*	*14*	*14*	*20*	*20*	*26*	*28*
^{146}Nd	451	458	456	452	452	457	451	457	455	453	441	464
1 σ	*15*	*15*	*16*	*16*	*15*	*15*	*16*	*16*	*19*	*19*	*25*	*27*
^{147}Sm	460	466	464	462	464	462	462	465	465	462	447	475
1 σ	*15*	*15*	*15*	*15*	*14*	*14*	*15*	*15*	*22*	*22*	*30*	*33*
^{153}Eu	450	454	454	450	452	452	452	452	453	452	436	465
1 σ	*14*	*14*	*15*	*15*	*14*	*14*	*14*	*14*	*22*	*22*	*30*	*33*
^{157}Gd	449	451	454	446	448	453	448	452	451	450	433	463
1 σ	*14*	*14*	*16*	*15*	*14*	*14*	*15*	*15*	*22*	*22*	*30*	*33*
^{159}Tb	439	445	443	441	443	441	440	444	444	441	424	456
1 σ	*14*	*14*	*15*	*15*	*14*	*14*	*14*	*14*	*24*	*24*	*33*	*36*
^{161}Dy	451	455	456	450	452	454	453	453	454	453	435	467
1 σ	*14*	*14*	*15*	*15*	*14*	*14*	*14*	*14*	*24*	*24*	*32*	*35*
^{165}Ho	472	478	479	471	476	474	473	477	476	476	453	493
1 σ	*15*	*15*	*17*	*16*	*15*	*15*	*15*	*15*	*28*	*28*	*39*	*44*
^{167}Er	460	466	466	459	462	464	462	464	464	463	440	481
1 σ	*15*	*15*	*16*	*16*	*14*	*14*	*14*	*15*	*29*	*29*	*40*	*45*
^{169}Tm	452	456	455	453	454	454	452	456	455	454	433	471
1 σ	*14*	*14*	*15*	*15*	*14*	*14*	*14*	*14*	*27*	*27*	*37*	*42*
^{173}Yb	479	479	482	475	479	480	476	482	483	476	452	501
1 σ	*15*	*15*	*16*	*16*	*15*	*15*	*16*	*16*	*34*	*34*	*47*	*54*
^{175}Lu	466	468	470	464	467	467	465	469	468	468	443	487
1 σ	*15*	*15*	*15*	*15*	*14*	*14*	*15*	*15*	*30*	*30*	*43*	*48*
^{178}Hf	455	461	461	455	457	460	457	459	458	459	435	476
1 σ	*15*	*15*	*16*	*16*	*14*	*14*	*14*	*15*	*28*	*28*	*39*	*44*
^{181}Ta	488	493	497	484	489	493	487	494	491	492	460	516
1 σ	*16*	*17*	*20*	*19*	*16*	*16*	*17*	*17*	*37*	*37*	*52*	*60*
^{232}Th	479	483	484	477	480	482	479	484	483	481	451	506
1 σ	*15*	*16*	*17*	*17*	*15*	*15*	*16*	*16*	*36*	*36*	*51*	*60*
^{238}U	485	489	492	481	485	490	484	491	489	487	457	513
1 σ	*16*	*16*	*18*	*18*	*16*	*16*	*17*	*18*	*37*	*37*	*52*	*60*

A3.4. Analyses of the international standard (610 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of the perovskites. Data given in ppm.

	610-13	610-14	610-15	610-16	610-17	610-18	610-19	610-20	610-21	610-22	610-23	610-24
^{23}Na	98000	96300	96900	97500	97100	97300	96200	98200	95600	94800	96700	97600
1 σ	*3200*	*3200*	*3400*	*3500*	*3200*	*3200*	*3500*	*3600*	*3200*	*3200*	*3100*	*3100*
^{25}Mg	458	452	457	454	456	454	451	459	466	464	453	457
1 σ	*15*	*15*	*17*	*16*	*16*	*16*	*16*	*17*	*18*	*18*	*15*	*16*
^{39}K	473	454	466	461	462	465	459	468	487	485	460	466
1 σ	*19*	*18*	*23*	*23*	*16*	*16*	*17*	*17*	*17*	*17*	*15*	*16*
^{42}Ca	82000	81800	81600	82200	82000	81800	81700	82100	82200	81500	82200	81700
1 σ	*2600*	*2600*	*2600*	*2700*	*2600*	*2600*	*2600*	*2600*	*2700*	*2700*	*2700*	*2700*
^{43}Ca	81900	81900	81900	81900	81900	81900	81900	81900	81800	81800	81900	81900
1 σ	*2600*	*2600*	*2600*	*2600*	*2600*	*2600*	*2600*	*2600*	*2600*	*2600*	*2600*	*2700*
^{45}Sc	451	449	451	450	450	450	449	451	443	439	452	449
1 σ	*14*	*14*	*14*	*14*	*14*	*14*	*14*	*14*	*15*	*15*	*15*	*15*
^{51}V	445	443	443	445	445	443	443	445	444	439	444	444
1 σ	*14*	*14*	*14*	*14*	*14*	*14*	*14*	*14*	*15*	*15*	*14*	*14*
^{57}Fe	460	447	443	462	449	457	448	458	462	452	464	446
1 σ	*19*	*19*	*26*	*27*	*16*	*17*	*20*	*20*	*23*	*23*	*22*	*22*
^{85}Rb	434	426	431	429	431	429	428	432	434	428	429	431
1 σ	*14*	*14*	*15*	*15*	*14*	*14*	*14*	*14*	*15*	*14*	*13*	*14*
^{86}Sr	457	584	520	520	526	524	522	528	501	494	527	523
1 σ	*59*	*74*	*100*	*100*	*17*	*17*	*18*	*18*	*17*	*17*	*17*	*17*
^{88}Sr	525	525	524	526	524	526	521	529	502	493	529	522
1 σ	*16*	*16*	*16*	*16*	*17*	*17*	*18*	*18*	*18*	*18*	*17*	*17*
^{89}Y	491	489	490	490	490	490	488	492	454	446	495	487
1 σ	*15*	*15*	*15*	*15*	*15*	*15*	*16*	*16*	*16*	*16*	*16*	*16*
^{90}Zr	488	492	489	491	490	490	488	492	442	438	492	489
1 σ	*15*	*16*	*16*	*16*	*15*	*15*	*15*	*16*	*14*	*14*	*16*	*16*
^{93}Nb	512	512	513	511	513	511	510	515	423	416	514	511
1 σ	*16*	*16*	*16*	*16*	*16*	*16*	*17*	*17*	*14*	*14*	*16*	*16*
^{137}Ba	442	450	445	447	446	446	445	447	428	420	450	443
1 σ	*14*	*15*	*16*	*16*	*14*	*14*	*14*	*14*	*15*	*15*	*15*	*15*
^{139}La	440	440	441	439	441	439	437	443	461	454	442	438
1 σ	*14*	*14*	*14*	*14*	*14*	*14*	*14*	*15*	*16*	*16*	*14*	*14*
^{140}Ce	446	446	447	445	446	446	444	448	449	447	444	448
1 σ	*14*	*14*	*14*	*14*	*14*	*14*	*14*	*14*	*14*	*14*	*14*	*14*
^{141}Pr	472	463	468	468	469	467	467	469	433	427	469	468
1 σ	*15*	*15*	*17*	*17*	*15*	*14*	*15*	*15*	*14*	*14*	*15*	*15*
^{146}Nd	458	450	456	453	456	452	451	457	436	426	458	451
1 σ	*15*	*15*	*16*	*16*	*14*	*14*	*15*	*15*	*16*	*16*	*15*	*15*
^{147}Sm	468	458	465	462	463	463	460	466	454	447	465	462
1 σ	*15*	*15*	*17*	*17*	*15*	*15*	*15*	*15*	*16*	*16*	*15*	*15*
^{153}Eu	457	447	452	452	453	451	450	454	463	459	452	452
1 σ	*15*	*15*	*16*	*17*	*14*	*14*	*14*	*15*	*15*	*15*	*14*	*14*
^{157}Gd	456	444	450	450	449	451	448	452	423	417	453	448
1 σ	*15*	*15*	*18*	*18*	*14*	*14*	*14*	*15*	*14*	*14*	*14*	*14*
^{159}Tb	447	437	442	442	443	441	439	445	447	439	444	440
1 σ	*15*	*14*	*16*	*17*	*14*	*14*	*14*	*15*	*16*	*15*	*14*	*14*
^{161}Dy	458	448	458	449	454	452	451	455	431	423	456	451
1 σ	*15*	*15*	*18*	*18*	*14*	*14*	*14*	*14*	*15*	*15*	*14*	*14*
^{165}Ho	481	469	476	475	475	475	473	477	453	446	477	474
1 σ	*16*	*16*	*19*	*19*	*15*	*15*	*15*	*15*	*15*	*15*	*15*	*15*
^{167}Er	468	458	465	462	463	464	461	465	428	424	464	463
1 σ	*15*	*15*	*17*	*17*	*14*	*14*	*15*	*15*	*14*	*14*	*15*	*15*
^{169}Tm	459	449	455	454	455	453	453	455	425	416	457	452
1 σ	*15*	*15*	*17*	*17*	*14*	*14*	*14*	*14*	*15*	*15*	*14*	*14*
^{173}Yb	486	472	478	480	479	479	478	481	466	457	482	477
1 σ	*17*	*16*	*20*	*21*	*15*	*15*	*15*	*15*	*17*	*16*	*15*	*15*
^{175}Lu	474	460	467	467	468	466	465	469	439	430	471	464
1 σ	*16*	*16*	*20*	*20*	*15*	*14*	*15*	*15*	*16*	*15*	*15*	*15*
^{178}Hf	464	452	458	458	460	456	454	462	421	414	459	458
1 σ	*16*	*15*	*19*	*19*	*15*	*15*	*16*	*16*	*15*	*15*	*14*	*14*
^{181}Ta	499	482	493	489	494	488	487	494	380	373	493	489
1 σ	*18*	*17*	*22*	*23*	*16*	*16*	*17*	*18*	*13*	*13*	*16*	*16*
^{232}Th	491	471	482	481	482	480	479	483	455	446	484	479
1 σ	*18*	*18*	*24*	*25*	*15*	*15*	*15*	*16*	*16*	*16*	*15*	*15*
^{238}U	499	475	489	486	488	486	484	490	461	453	488	486
1 σ	*20*	*19*	*27*	*28*	*15*	*15*	*16*	*16*	*16*	*16*	*15*	*15*

A3.4. Analyses of the international standard (610 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of the perovskites. Data given in ppm.

	610-25	610-26	610-27	610-28	610-29	610-30
^{23}Na	96700	97600	97300	96900	99200	96000
1 σ	*3200*	*3200*	*3400*	*3400*	*4000*	*4000*
^{25}Mg	457	453	451	459	461	450
1 σ	*16*	*16*	*16*	*16*	*19*	*19*
^{39}K	461	465	459	467	466	461
1 σ	*16*	*17*	*16*	*16*	*17*	*18*
^{42}Ca	81400	82300	81300	82500	82600	81400
1 σ	*2700*	*2800*	*2700*	*2800*	*3000*	*3000*
^{43}Ca	81900	81900	81900	81900	81900	81900
1 σ	*2600*	*2600*	*2600*	*2600*	*2600*	*2600*
^{45}Sc	447	452	446	454	454	447
1 σ	*15*	*15*	*15*	*15*	*17*	*17*
^{51}V	441	446	442	445	451	439
1 σ	*15*	*15*	*15*	*15*	*17*	*17*
^{57}Fe	441	464	445	461	460	447
1 σ	*29*	*31*	*18*	*19*	*25*	*25*
^{85}Rb	429	431	432	427	440	424
1 σ	*14*	*14*	*15*	*15*	*19*	*19*
^{86}Sr	523	527	521	528	538	516
1 σ	*17*	*17*	*19*	*19*	*25*	*25*
^{88}Sr	524	527	523	526	531	521
1 σ	*18*	*18*	*17*	*17*	*19*	*19*
^{89}Y	487	493	487	492	493	487
1 σ	*18*	*18*	*16*	*16*	*17*	*17*
^{90}Zr	488	492	489	491	495	487
1 σ	*16*	*16*	*16*	*16*	*17*	*17*
^{93}Nb	509	515	512	512	519	508
1 σ	*17*	*17*	*17*	*17*	*18*	*18*
^{137}Ba	444	448	444	448	450	443
1 σ	*16*	*16*	*14*	*14*	*15*	*15*
^{139}La	440	440	439	440	446	436
1 σ	*14*	*14*	*14*	*14*	*16*	*16*
^{140}Ce	444	448	443	448	452	442
1 σ	*15*	*15*	*14*	*15*	*16*	*16*
^{141}Pr	466	470	467	469	474	464
1 σ	*15*	*15*	*15*	*15*	*17*	*17*
^{146}Nd	451	457	452	456	457	452
1 σ	*16*	*17*	*14*	*14*	*15*	*15*
^{147}Sm	466	461	465	461	467	461
1 σ	*15*	*15*	*15*	*15*	*16*	*16*
^{153}Eu	450	454	451	453	457	449
1 σ	*14*	*14*	*14*	*14*	*16*	*16*
^{157}Gd	448	452	450	450	452	449
1 σ	*15*	*15*	*14*	*14*	*14*	*14*
^{159}Tb	440	444	439	444	445	439
1 σ	*14*	*15*	*14*	*14*	*15*	*15*
^{161}Dy	452	454	451	455	460	448
1 σ	*15*	*15*	*15*	*15*	*17*	*17*
^{165}Ho	473	477	473	476	481	471
1 σ	*15*	*15*	*15*	*15*	*17*	*17*
^{167}Er	460	466	461	464	467	460
1 σ	*15*	*15*	*15*	*15*	*16*	*16*
^{169}Tm	452	456	452	456	457	452
1 σ	*15*	*15*	*14*	*14*	*15*	*15*
^{173}Yb	476	482	477	481	481	477
1 σ	*16*	*17*	*15*	*15*	*16*	*16*
^{175}Lu	463	471	465	468	471	464
1 σ	*17*	*17*	*15*	*15*	*16*	*16*
^{178}Hf	456	460	456	460	462	455
1 σ	*15*	*15*	*14*	*15*	*16*	*16*
^{181}Ta	486	495	489	491	497	486
1 σ	*17*	*17*	*16*	*16*	*18*	*18*
^{232}Th	478	484	479	483	486	478
1 σ	*16*	*16*	*15*	*16*	*17*	*17*
^{238}U	487	487	487	486	493	483
1 σ	*15*	*15*	*16*	*16*	*17*	*17*

A3.4. Analyses of the international standards (612 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of silicates and ilmenite. Data given in ppm.

	612_01	612_02	612_03	612_04	612_05	612_06	612_07	612_08	612_09	612_10	612_11
Sc_ppm	41.9	40.6	40.4	40.5	40.8	42.1	42.9	40.7	40.9	40.9	41.7
Sc_IntSE (%)	7%	6%	3%	3%	3%	4%	4%	3%	3%	3%	3%
Ti_ppm	43.7	42.1	43.7	45.6	40.7	44.6	48.9	44.2	43.3	42.4	44.4
Ti_IntSE (%)	9%	9%	6%	7%	6%	8%	6%	7%	7%	8%	7%
V_ppm	38.6	39	38.8	38.9	38.2	40.8	39.6	39.2	39.2	38.7	39.4
V_IntSE (%)	6%	5%	4%	4%	3%	4%	5%	4%	4%	3%	3%
Cr_ppm	36.7	37.1	34.4	35	35.1	36.4	40.9	36.5	36.7	35.8	36.2
Cr_IntSE (%)	5%	5%	4%	3%	3%	4%	5%	4%	4%	4%	3%
Mn_ppm	39.2	38.2	36.9	37.2	36.6	39.4	40.5	38.1	38.7	37.8	38.7
Mn_IntSE (%)	6%	5%	4%	3%	3%	4%	4%	4%	3%	3%	3%
Co_ppm	35.1	34.7	34.7	35.1	33.7	36.6	36	35.5	34.8	34.6	36.2
Co_IntSE (%)	7%	5%	3%	4%	3%	4%	5%	4%	4%	4%	3%
Ni_ppm	37.5	39	38.6	38	37.8	40.9	38.1	39.8	38.7	38.9	39.4
Ni_IntSE (%)	6%	6%	5%	6%	5%	5%	6%	6%	5%	5%	4%
Ga_ppm	35.9	35.7	35.9	35.6	35.3	37.3	36.5	36.6	35.5	35.8	36.94
Ga_IntSE (%)	6%	5%	4%	3%	3%	3%	4%	4%	3%	3%	3%
Rb_ppm	31.2	31.2	31.1	31	30.73	33.1	31.1	32	31.2	31.2	32.15
Rb_IntSE (%)	6%	5%	4%	4%	3%	4%	5%	4%	4%	4%	3%
Sr_ppm	78.5	76.8	77.9	79.2	76	82.6	77.6	78.4	78.1	78.6	79.3
Sr_IntSE (%)	6%	6%	3%	3%	3%	3%	4%	3%	3%	3%	2%
Y_ppm	38.3	37	38.2	37.54	37.5	39.5	37.4	37.8	38.6	37.6	38.5
Y_IntSE (%)	7%	6%	3%	3%	3%	3%	4%	3%	3%	3%	3%
Zr_ppm	38.1	37.3	37.9	37.8	37.5	39.3	36.9	38	38.55	37.5	38.1
Zr_IntSE (%)	7%	7%	3%	3%	3%	3%	4%	3%	2%	3%	3%
Nb_ppm	40.6	38.9	39.7	40.4	39.3	41.6	39.6	40.1	40.2	39.8	40.9
Nb_IntSE (%)	7%	6%	3%	3%	3%	4%	4%	3%	3%	3%	3%
Cs_ppm	42.5	41	41.6	41.6	41.5	44.1	41	42.8	41.9	41.9	43.8
Cs_IntSE (%)	6%	5%	4%	4%	3%	3%	5%	4%	4%	4%	3%
Ba_ppm	42	38.2	38.9	39	39.4	42.3	38.8	40.4	40.2	39	40.4
Ba_IntSE (%)	7%	6%	4%	4%	4%	4%	5%	4%	3%	4%	3%
La_ppm	36.7	34.9	35.3	35.8	35.29	37.6	34.8	36	36.15	35.5	36.3
La_IntSE (%)	7%	6%	3%	3%	2%	3%	4%	3%	3%	3%	3%
Ce_ppm	39.4	37.7	38.3	38.6	38	40.3	37.7	39.4	39	38.2	39.06
Ce_IntSE (%)	7%	6%	4%	3%	3%	3%	4%	4%	3%	3%	2%
Pr_ppm	37.8	36.2	37.1	36.8	36.53	39.4	37	37.3	37.3	36.9	38
Pr_IntSE (%)	7%	6%	3%	3%	3%	3%	4%	3%	3%	3%	3%
Nd_ppm	36.4	35	35.8	35.7	35.7	37.1	35.7	35.6	36.5	35.5	36.3
Nd_IntSE (%)	7%	7%	3%	3%	3%	3%	4%	4%	4%	4%	3%
Sm_ppm	40	36.6	37.5	38.5	37.3	39.2	37.5	38.3	38.5	37.7	38.7
Sm_IntSE (%)	8%	7%	4%	3%	3%	3%	4%	4%	3%	3%	4%
Eu_ppm	34.9	34.9	35.1	34.96	34.89	35.2	34.9	35	34.9	35	35.11
Eu_IntSE (%)	7%	6%	3%	3%	3%	3%	4%	3%	3%	3%	3%
Gd_ppm	37.7	35.9	36.5	36.2	36.1	39.5	36.4	36.5	37.5	36.1	37.9
Gd_IntSE (%)	8%	7%	4%	3%	3%	4%	4%	3%	3%	3%	3%
Tb_ppm	36.6	34.9	36.1	35.75	35.56	37.6	35.6	35.9	36.4	35.7	36.5
Tb_IntSE (%)	8%	7%	3%	3%	3%	3%	4%	3%	3%	3%	3%
Dy_ppm	35.7	36	36	36	35.7	36.4	35.9	36	36	36	36.2
Dy_IntSE (%)	8%	7%	3%	3%	3%	4%	4%	4%	3%	3%	3%
Ho_ppm	37.9	36.9	38	37.9	37.24	39.5	38	37.8	38.1	37.9	38.7
Ho_IntSE (%)	8%	7%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Er_ppm	38.2	37.1	38.1	37.1	37.8	39.8	37.6	38.1	38	37.8	38.8
Er_IntSE (%)	8%	7%	3%	3%	3%	3%	4%	3%	3%	3%	3%
Tm_ppm	37.8	37.1	38	38	37.25	39.6	38.3	37.4	38.3	37.9	38.6
Tm_IntSE (%)	8%	7%	3%	3%	2%	3%	4%	3%	3%	3%	3%
Yb_ppm	38.4	38.8	39.7	38.4	38.8	40.2	39.5	38.9	39.4	39	39.6
Yb_IntSE (%)	7%	7%	3%	3%	3%	3%	4%	3%	3%	3%	3%
Lu_ppm	36.8	36.7	36.9	37.1	36.43	37.5	36.8	36.9	36.9	36.9	37
Lu_IntSE (%)	8%	7%	3%	3%	3%	3%	4%	3%	3%	3%	3%
Hf_ppm	35.2	34.6	34.5	35.3	34.24	36.7	34.7	35.2	34.9	34.9	35.8
Hf_IntSE (%)	8%	7%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Ta_ppm	39.6	40	40	40.2	39.6	40.3	40	39.8	40.2	39.9	40.1
Ta_IntSE (%)	8%	7%	3%	3%	3%	3%	4%	3%	3%	3%	3%

A3.4. Analyses of the international standards (612 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of silicates and ilmenite. Data given in ppm.

	612_12	612_13	612_14	612_15	612_16	612_17	612_18	612_19	612_20	612_21	612_22
Sc_ppm	40.11	41.2	41.2	41.9	41.1	40.4	41.6	40.5	39.99	42.27	41.1
Sc_IntSE (%)	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Ti_ppm	42.7	44.9	44	45.2	43.9	43.4	46.2	43	42.3	44	45.4
Ti_IntSE (%)	7%	8%	7%	7%	6%	6%	7%	7%	7%	7%	6%
V_ppm	38.4	39.1	39.2	40.9	37.9	39.4	39.6	38.5	38.3	39.81	39.26
V_IntSE (%)	3%	3%	4%	4%	3%	3%	3%	3%	2%	2%	2%
Cr_ppm	35.1	35.9	36.7	37.4	35.8	35.59	36.79	35.39	35.71	36.09	37
Cr_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	3%	2%	2%	3%
Mn_ppm	37	37.94	38.3	39.7	37.44	37.74	38.43	37.8	37.86	37.74	38.55
Mn_IntSE (%)	3%	3%	3%	3%	2%	2%	2%	3%	2%	2%	2%
Co_ppm	33.65	34.94	35.6	36.3	34.53	34.82	35.11	34.62	35.32	34.93	35.14
Co_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	2%	2%	3%	3%
Ni_ppm	37.3	39.5	39.3	39.3	38.5	38.7	39.5	38.1	38	39.4	39.7
Ni_IntSE (%)	4%	5%	5%	5%	5%	5%	4%	5%	4%	5%	4%
Ga_ppm	34.93	35.82	36.13	38.5	34.81	35.99	36.17	35.44	36.48	35.81	36.15
Ga_IntSE (%)	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%
Rb_ppm	30.4	31.32	31.74	32.5	30.48	31.6	31.64	30.6	31.5	31.8	31.08
Rb_IntSE (%)	3%	3%	3%	4%	3%	3%	2%	3%	3%	3%	3%
Sr_ppm	77.6	77.4	79.3	80	77.3	78.2	80.1	75.9	78.8	79.4	78.2
Sr_IntSE (%)	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%
Y_ppm	37.14	38.1	38.25	38.1	38.1	37.9	38.7	37.1	37.93	38.5	37.99
Y_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	2%
Zr_ppm	37.7	38.2	37.9	38.3	37.9	37.9	38.8	36.9	38.3	38.2	38
Zr_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%
Nb_ppm	38.9	40.1	40.3	41	39.28	40.3	40.5	39.2	40.1	40.3	40
Nb_IntSE (%)	3%	3%	3%	3%	2%	3%	3%	3%	3%	3%	3%
Cs_ppm	41	41	43	44.7	40.8	42.1	42.4	41.4	42	42.5	41.7
Cs_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%
Ba_ppm	38.7	39.9	39.7	41	38.8	39.6	40	39.2	39.1	41.6	39.6
Ba_IntSE (%)	3%	4%	4%	4%	3%	3%	3%	3%	3%	4%	3%
La_ppm	35.15	36.03	35.8	36.8	35.25	35.84	36.63	34.36	35.68	36.7	35.8
La_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Ce_ppm	38.38	38.6	38.7	39	38.5	38.7	39	37.9	38.5	39.7	38.5
Ce_IntSE (%)	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Pr_ppm	36.31	37.22	37.4	38.6	36.7	37.08	37.43	36.4	37.4	37.7	36.98
Pr_IntSE (%)	3%	3%	3%	4%	3%	2%	3%	3%	3%	3%	3%
Nd_ppm	35.1	35.6	36.5	36.2	35.6	35.9	36.2	35.5	35.2	37.1	35.6
Nd_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	3%	3%	4%	3%
Sm_ppm	37	38.7	38.1	38.4	37.8	38.1	39.2	36.7	37.8	39.1	38.2
Sm_IntSE (%)	3%	3%	4%	4%	3%	4%	3%	3%	4%	3%	3%
Eu_ppm	34.82	35.5	35	35	35	35	35.2	34.8	35	35.1	34.9
Eu_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Gd_ppm	35.7	36.8	36.8	37.7	37.1	35.9	37.9	35.5	36.1	38.1	36.9
Gd_IntSE (%)	3%	4%	3%	4%	4%	3%	3%	3%	4%	4%	3%
Tb_ppm	35.43	36.1	36.1	36.6	35.4	36.2	36.7	35.2	35.6	36.9	35.79
Tb_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%
Dy_ppm	35.7	36.3	36	36.1	35.9	36.1	36.1	36	35.7	36.1	35.9
Dy_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	4%	3%	4%	4%
Ho_ppm	37.3	37.8	38.4	38.3	37.7	38	38.3	37.4	37.6	38.6	37.9
Ho_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	3%	4%	3%	3%
Er_ppm	36.9	38.4	38.1	38.7	37.8	37.7	38.5	37.3	37.6	38.8	37.7
Er_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	3%	4%	3%	3%
Tm_ppm	37.3	38.3	38.1	38.5	37.5	38.2	38.3	37.6	37.6	38.8	37.7
Tm_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%
Yb_ppm	39	38.7	39.7	39.2	39.2	39.1	39.9	38.1	39.2	39.6	39.4
Yb_IntSE (%)	3%	3%	4%	4%	3%	4%	3%	3%	4%	4%	3%
Lu_ppm	36.8	36.9	36.9	37.1	36.7	37	37	36.8	36.7	37	36.9
Lu_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	3%	4%	4%	3%
Hf_ppm	34.4	34.44	35.7	35.5	34.8	34.8	35.4	34.1	34.8	36.2	34.6
Hf_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	4%	3%	4%	3%
Ta_ppm	39.8	40	40	40.1	39.9	40.1	40.2	39.9	39.9	40.1	39.9
Ta_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%

A3.4. Analyses of the international standards (612 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of silicates and ilmenite. Data given in ppm.

	612_23	612_24	612_25	612_26	612_27	612_28	612_29	612_30	612_31	612_32	612_33
Sc_ppm	40.6	41.09	40.77	40.9	41.18	40.5	41.7	41	40.8	42	40.2
Sc_IntSE (%)	3%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Ti_ppm	46.2	41.5	43.3	48.2	41.2	43.6	41.9	46.5	44.1	43.2	42.8
Ti_IntSE (%)	6%	6%	7%	6%	7%	8%	8%	7%	6%	7%	7%
V_ppm	39	38.7	39.17	38.62	39.3	38.8	39	39.1	39.06	38.9	38.7
V_IntSE (%)	3%	3%	2%	2%	3%	3%	3%	3%	2%	3%	3%
Cr_ppm	35.75	35.47	36.66	34.72	36.68	35.6	35.87	35.74	36.78	35.7	36
Cr_IntSE (%)	3%	3%	3%	3%	2%	3%	2%	3%	3%	3%	3%
Mn_ppm	38.38	37.31	38.03	37.98	38	37.51	38.62	38.27	37.63	38.01	37.8
Mn_IntSE (%)	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%
Co_ppm	35.29	34.5	35.26	34.69	35.05	34.6	35.46	35.02	34.86	34.64	35.42
Co_IntSE (%)	3%	3%	2%	3%	3%	3%	3%	3%	3%	3%	3%
Ni_ppm	39.4	37.5	38	40	38.9	39	37.8	39.7	38.7	38.8	38.6
Ni_IntSE (%)	4%	5%	4%	4%	4%	5%	4%	4%	5%	4%	4%
Ga_ppm	36.5	35.66	36.25	35.75	36.04	35.89	35.7	36.59	35.9	36.09	35.84
Ga_IntSE (%)	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Rb_ppm	31.81	31.06	31.38	31.49	31.35	31.32	31.24	31.83	31.39	30.89	31.74
Rb_IntSE (%)	3%	3%	2%	3%	3%	3%	3%	3%	3%	3%	3%
Sr_ppm	78.9	78.1	79	77.4	78.8	78.7	77.1	80.2	77.6	79	77.8
Sr_IntSE (%)	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	2%
Y_ppm	38.2	37.85	38.3	37.4	38.19	38	37.8	38.3	37.9	38.2	37.9
Y_IntSE (%)	3%	2%	3%	3%	2%	3%	3%	3%	3%	3%	3%
Zr_ppm	38.1	37.8	38	38.2	37.8	38.3	37.7	37.8	38.2	38	38.1
Zr_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Nb_ppm	40.1	39.86	40.17	39.8	39.96	39.9	40.1	39.9	40.1	40.2	39.5
Nb_IntSE (%)	3%	2%	2%	3%	2%	3%	2%	3%	3%	3%	3%
Cs_ppm	42.1	42	42.15	41.6	42.2	42.2	41.5	42.1	42.2	42	41.9
Cs_IntSE (%)	3%	2%	2%	3%	3%	3%	3%	3%	3%	3%	3%
Ba_ppm	39.4	39.7	40.4	39.2	39.6	39.8	38.8	40.9	39.5	38.6	40.1
Ba_IntSE (%)	3%	3%	3%	3%	3%	4%	3%	3%	4%	4%	3%
La_ppm	35.6	35.78	36.2	35.3	35.75	36.06	35.3	35.9	36	35.7	35.97
La_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Ce_ppm	38.6	38.8	38.95	38.4	38.7	38.6	38.7	39.3	38.3	38.3	39.2
Ce_IntSE (%)	3%	3%	2%	3%	3%	3%	3%	3%	3%	3%	3%
Pr_ppm	37.4	37.07	37.66	36.62	37.26	37.5	36.9	37.1	37.3	37.36	37.2
Pr_IntSE (%)	3%	3%	2%	3%	2%	3%	3%	3%	3%	3%	3%
Nd_ppm	36.3	35.7	36.1	35.9	35.6	36.4	35.3	35.8	36	36.4	35.5
Nd_IntSE (%)	3%	3%	3%	4%	3%	3%	4%	3%	3%	3%	3%
Sm_ppm	37.7	38.4	38.3	37.8	38.1	38.7	37	38.3	38.7	38.1	38
Sm_IntSE (%)	3%	3%	3%	3%	3%	4%	3%	3%	4%	3%	3%
Eu_ppm	35.1	34.97	35	35.01	34.99	35	35.1	34.9	35.2	35	35.1
Eu_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Gd_ppm	36.2	36.9	37	37	36.1	37.2	36.7	36	37	37.4	35.9
Gd_IntSE (%)	3%	4%	3%	3%	4%	3%	4%	4%	4%	3%	4%
Tb_ppm	36.1	36	36.08	35.8	36.1	36.1	35.8	35.9	36.2	36.1	35.7
Tb_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Dy_ppm	36.2	36	36	36.1	36	36.1	35.8	36.1	36	36.3	35.6
Dy_IntSE (%)	3%	3%	3%	4%	3%	4%	4%	3%	4%	4%	4%
Ho_ppm	38.1	37.9	38.1	37.8	38	38.2	37.8	37.8	38.1	38.3	37.6
Ho_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Er_ppm	38.1	38	38	37.9	38	38.2	37.8	38.1	37.9	38.3	37.9
Er_IntSE (%)	3%	3%	3%	3%	3%	4%	4%	4%	3%	3%	4%
Tm_ppm	38.1	38	38.5	37.5	38.1	38.6	37.4	37.9	38.3	38.4	37.7
Tm_IntSE (%)	3%	3%	3%	3%	3%	4%	3%	3%	3%	4%	4%
Yb_ppm	38.9	39.2	39.3	39.1	39.2	39.4	39	39	39.4	39.3	39.1
Yb_IntSE (%)	4%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Lu_ppm	36.8	36.9	36.9	36.9	36.9	37	36.8	36.9	36.9	37	36.8
Lu_IntSE (%)	3%	3%	3%	4%	3%	3%	4%	4%	4%	4%	4%
Hf_ppm	34.9	35	35.3	34.8	34.9	35.1	35	34.7	35.2	35.7	34.4
Hf_IntSE (%)	3%	3%	3%	3%	3%	4%	4%	3%	3%	4%	4%
Ta_ppm	40.1	40	40	40	40	40.1	39.9	40	40	40.1	39.8
Ta_IntSE (%)	3%	3%	3%	4%	3%	3%	4%	4%	3%	3%	4%

A3.4. Analyses of the international standards (612 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of silicates and ilmenite. Data given in ppm.

	612_34	612_35	612_36	612_37	612_38	612_39	612_40	612_41	612_42	612_43	612_44
Sc_ppm	40.8	41.2	40.6	41.4	40.99	41.14	41	40.24	41.9	40.9	39.8
Sc_IntSE (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%
Ti_ppm	44.3	45.3	45.2	42.7	44.7	44.2	43	45	45.3	43.2	42.5
Ti_IntSE (%)	7%	6%	7%	6%	8%	6%	5%	6%	6%	6%	9%
V_ppm	39.4	38.8	39.37	38.6	38.79	39.19	39.4	38.4	39.2	39.02	39.2
V_IntSE (%)	3%	3%	2%	3%	2%	2%	3%	3%	3%	2%	3%
Cr_ppm	35.7	36.45	35.92	36.5	35.77	35.96	38.31	34.68	34.8	36.2	36.4
Cr_IntSE (%)	3%	3%	3%	3%	2%	2%	2%	3%	3%	2%	3%
Mn_ppm	38.28	37.82	38.16	37.9	38.32	37.57	39.76	36.91	37.58	38.28	37.6
Mn_IntSE (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%
Co_ppm	35.2	34.74	35	35.26	34.35	35.43	35.29	34.8	34.93	35.02	34.97
Co_IntSE (%)	3%	3%	3%	3%	3%	2%	3%	3%	3%	2%	3%
Ni_ppm	38.7	39.1	37.8	40.1	38.3	39.1	40.2	37.7	39.4	38.5	39.2
Ni_IntSE (%)	4%	4%	4%	4%	5%	4%	4%	4%	4%	4%	5%
Ga_ppm	35.76	36.49	35.94	36.35	35.3	36.43	36.55	35.47	35.81	36.16	36.5
Ga_IntSE (%)	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	3%
Rb_ppm	31.6	31.29	31.34	31.6	30.95	31.82	32.03	30.47	31.33	31.86	31.17
Rb_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Sr_ppm	78.2	78.9	78.1	78.9	77.7	79.1	78.8	77.6	78.5	78.8	78.3
Sr_IntSE (%)	2%	3%	3%	3%	2%	3%	2%	2%	2%	2%	2%
Y_ppm	37.6	38.3	38.2	37.5	38.3	38.08	37.83	38.16	37.99	38.12	37.7
Y_IntSE (%)	3%	3%	3%	3%	3%	3%	2%	3%	3%	2%	3%
Zr_ppm	37.9	37.9	38.3	37.4	38.1	38.2	37.7	37.7	38.9	37.79	37.5
Zr_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%
Nb_ppm	40.2	40.2	39.8	39.9	40.1	40.1	40.4	39.37	40.1	40.24	39.8
Nb_IntSE (%)	2%	2%	3%	3%	2%	3%	2%	2%	2%	2%	3%
Cs_ppm	41.9	42.3	41.8	42.3	41.3	42.42	42.6	41.1	41.6	42.5	42.3
Cs_IntSE (%)	3%	3%	3%	3%	3%	2%	3%	3%	3%	3%	4%
Ba_ppm	39.8	39.9	39.8	39.8	38.7	40.8	40	38.7	39.7	40.4	39.2
Ba_IntSE (%)	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%	4%
La_ppm	35.5	35.9	35.7	35.7	35.6	36.12	35.64	35.5	35.99	35.97	35.5
La_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	2%	3%
Ce_ppm	38.6	38.9	38.9	38.3	38.6	39.01	39.1	38	38.9	38.9	38.7
Ce_IntSE (%)	3%	3%	3%	3%	3%	2%	3%	3%	3%	3%	3%
Pr_ppm	37	37.4	37.2	37.3	36.9	37.42	37.5	36.92	36.92	37.53	36.9
Pr_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	2%	2%	3%
Nd_ppm	35.5	36.2	36	36	35.5	36.2	36.5	34.9	35.9	36.2	35.6
Nd_IntSE (%)	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%	3%
Sm_ppm	37.8	38.4	38	38	37.7	38.7	38.6	37.5	37.6	38.5	37.9
Sm_IntSE (%)	4%	3%	3%	4%	3%	4%	3%	3%	3%	3%	4%
Eu_ppm	34.7	35.1	35	34.9	35	35	35	34.94	34.99	35.01	35
Eu_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Gd_ppm	36.8	36.8	36.3	36.3	37.4	36.9	36.9	35.7	36.7	37.3	36.1
Gd_IntSE (%)	4%	4%	4%	4%	4%	4%	3%	4%	3%	3%	4%
Tb_ppm	35.8	36.3	35.9	36.1	35.9	36.2	36.2	35.5	36	36.2	35.7
Tb_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%
Dy_ppm	36.1	36	36	35.9	36	36	36.1	35.9	36	36	35.9
Dy_IntSE (%)	3%	4%	4%	3%	3%	3%	3%	4%	3%	3%	4%
Ho_ppm	38.2	37.9	38	37.9	38.1	38	38.5	37.1	38.1	38.2	37.9
Ho_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%
Er_ppm	37.8	38	38	38.1	37.9	38.1	39	36.4	38.4	38.3	37.5
Er_IntSE (%)	3%	3%	4%	4%	4%	3%	3%	3%	3%	3%	4%
Tm_ppm	37.7	38.2	37.9	38.2	38	38	38.3	37.6	37.8	38.3	37.5
Tm_IntSE (%)	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%	4%
Yb_ppm	39.3	39.1	39.2	38.9	39.6	39	39.5	38.5	39.3	39.3	39.2
Yb_IntSE (%)	4%	4%	4%	4%	3%	4%	3%	4%	3%	3%	4%
Lu_ppm	36.9	36.9	36.9	37	36.8	36.9	37	36.6	37	36.9	36.9
Lu_IntSE (%)	4%	4%	4%	4%	4%	4%	3%	4%	3%	3%	4%
Hf_ppm	35.2	34.7	35.2	34.4	34.9	35.7	35.2	34.4	34.7	35.5	34.2
Hf_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	4%	3%	3%	4%
Ta_ppm	40	40	40	40	40	40	40.3	39.8	40	39.9	40
Ta_IntSE (%)	3%	4%	4%	4%	4%	3%	3%	3%	3%	3%	4%

A3.4. Analyses of the international standards (612 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of silicates and ilmenite. Data given in ppm.

	612_45	612_46	612_47	612_48	612_49	612_50	612_51	612_52	612_53	612_54	612_55
Sc_ppm	41.8	41	43.2	38.53	42.9	41	41.3	40.6	41.5	40.6	41.6
Sc_IntSE (%)	3%	3%	3%	2%	2%	3%	3%	2%	3%	2%	2%
Ti_ppm	44.5	44.4	45.6	41.4	48.2	44.2	45.1	42.2	44.4	45.8	41.4
Ti_IntSE (%)	8%	7%	7%	5%	7%	7%	7%	7%	7%	7%	7%
V_ppm	38	39.12	40.2	37.8	39.5	38.73	39.3	39.2	38.8	39.2	38.5
V_IntSE (%)	3%	2%	2%	3%	3%	3%	3%	3%	3%	3%	3%
Cr_ppm	36.09	36.6	33.98	43.2	33.44	36.02	36.1	35.6	36.2	35.8	35.47
Cr_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Mn_ppm	38.24	38.1	37.43	39.8	36.6	37.38	38.42	38.25	38.2	37.63	37.55
Mn_IntSE (%)	2%	3%	2%	3%	3%	2%	2%	2%	2%	2%	3%
Co_ppm	34.73	35.24	35.22	34.7	35.1	34.6	35.6	34.7	35.15	34.86	34.26
Co_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Ni_ppm	38	39.2	38.9	39	38.4	39	39	37.8	39.4	38.7	39
Ni_IntSE (%)	5%	5%	4%	4%	5%	4%	4%	4%	5%	4%	4%
Ga_ppm	35.36	36.13	36.63	35.77	35.91	35.91	36.2	35.84	36.2	35.9	35.86
Ga_IntSE (%)	2%	2%	2%	3%	2%	2%	3%	2%	3%	3%	3%
Rb_ppm	31.05	31.85	32.11	30.02	32.1	31.3	31.87	30.77	32.31	30.9	31.2
Rb_IntSE (%)	2%	3%	2%	3%	3%	3%	3%	3%	3%	3%	3%
Sr_ppm	77.5	79	81.1	74.9	80.3	78.2	79.2	78.3	78.6	77.7	78.8
Sr_IntSE (%)	2%	2%	3%	3%	2%	2%	3%	3%	3%	3%	3%
Y_ppm	37.7	38.4	39.5	36.4	38.87	37.6	38.6	37.8	38.2	37.6	38.4
Y_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Zr_ppm	38	38.4	39.5	36.3	39.3	37.7	38.3	38.1	38	37.8	37.9
Zr_IntSE (%)	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%	3%
Nb_ppm	39.62	40.6	41	38.7	40.53	39.7	40.6	40	39.9	39.7	40.4
Nb_IntSE (%)	2%	3%	3%	3%	2%	3%	3%	3%	3%	3%	3%
Cs_ppm	41.11	42.2	43.6	40.1	43.2	41.7	42.4	42.2	42	41.3	43
Cs_IntSE (%)	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%
Ba_ppm	39.1	40.4	41.1	36.6	40.9	39.1	40.4	39.9	39.9	39.4	39.1
Ba_IntSE (%)	3%	3%	3%	4%	3%	4%	4%	4%	4%	4%	4%
La_ppm	35.1	36.29	37.6	34.2	36.56	35.48	36.4	35.8	35.8	35.6	35.4
La_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Ce_ppm	38.22	38.71	40.1	37.53	39.3	38.3	39.5	39	38.5	38.6	38.4
Ce_IntSE (%)	3%	2%	3%	3%	3%	3%	4%	3%	3%	3%	3%
Pr_ppm	37.05	37.15	38.4	36.65	37.23	36.9	38.1	37	37.1	36.9	36.8
Pr_IntSE (%)	3%	3%	3%	3%	2%	3%	3%	3%	3%	3%	4%
Nd_ppm	35.5	36.4	36.9	35.1	36.3	35.6	36.4	35.9	36.1	35.6	35.9
Nd_IntSE (%)	3%	3%	4%	3%	4%	3%	4%	3%	4%	4%	4%
Sm_ppm	37.7	37.9	40	38	37.75	38.2	38.5	37.6	38.6	37.7	38
Sm_IntSE (%)	3%	3%	4%	3%	3%	3%	4%	3%	4%	3%	4%
Eu_ppm	34.93	35	35.2	34.93	35.03	35	35.1	35.1	35	35	34.9
Eu_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Gd_ppm	36.3	37.4	38.3	35.8	36.6	36.2	36.9	37.6	37.1	36.2	36.3
Gd_IntSE (%)	4%	4%	4%	3%	4%	3%	4%	4%	4%	4%	4%
Tb_ppm	35.6	36.3	37.3	35.5	36.1	35.8	36.2	36.2	36.1	35.7	35.8
Tb_IntSE (%)	3%	3%	4%	3%	3%	3%	4%	3%	4%	3%	4%
Dy_ppm	36	35.8	36.2	36	36	36	36.1	35.9	36.1	36	35.9
Dy_IntSE (%)	4%	4%	4%	3%	3%	3%	4%	4%	4%	4%	4%
Ho_ppm	37.9	37.8	39.1	37.7	37.9	37.8	38.1	38.1	38.2	37.7	38
Ho_IntSE (%)	4%	3%	4%	3%	3%	3%	4%	4%	4%	4%	4%
Er_ppm	37.5	38.5	39.7	37.6	37.8	37.9	37.7	39.3	37.6	37.9	37.3
Er_IntSE (%)	4%	4%	4%	3%	3%	3%	4%	4%	4%	4%	4%
Tm_ppm	37.9	38.4	38.6	37.8	37.7	38	37.8	38.3	38.1	37.7	37.9
Tm_IntSE (%)	3%	4%	4%	3%	3%	3%	4%	4%	4%	4%	4%
Yb_ppm	38.7	39.4	40	39	39	39.2	39.1	39.4	39.3	39.1	38.7
Yb_IntSE (%)	4%	4%	4%	3%	3%	4%	4%	4%	4%	4%	5%
Lu_ppm	36.9	36.8	37.1	36.8	36.9	37	36.7	37.1	36.9	36.9	36.7
Lu_IntSE (%)	4%	4%	4%	3%	3%	3%	4%	4%	4%	4%	4%
Hf_ppm	35	35.3	36.8	34.7	34.5	35	34.6	35.6	35.7	34.4	34.5
Hf_IntSE (%)	4%	4%	4%	3%	3%	3%	4%	4%	4%	4%	4%
Ta_ppm	40.1	39.9	40.1	40	39.9	40.1	39.8	40.1	40	40	39.8
Ta_IntSE (%)	3%	4%	4%	3%	3%	3%	4%	4%	4%	4%	4%

A3.4. Analyses of the international standards (612 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of silicates and ilmenite. Data given in ppm.

	612_56	612_57	612_58	612_59	612_60	612_61	612_62	612_63	612_64	612_65	612_66
Sc_ppm	41.13	40.2	41.14	41.3	40.6	43.2	38.32	41.7	40.82	42.8	40.6
Sc_IntSE (%)	2%	3%	2%	3%	2%	3%	2%	3%	2%	3%	3%
Ti_ppm	47.4	43.4	44.3	43.3	44.3	47.3	40.1	44.2	43.9	48.1	42.9
Ti_IntSE (%)	8%	7%	5%	6%	7%	7%	6%	6%	7%	6%	7%
V_ppm	39.21	39	38.9	39.1	38.06	40.9	38.1	38.23	39.16	39.8	38.9
V_IntSE (%)	2%	3%	3%	2%	2%	2%	3%	3%	3%	3%	3%
Cr_ppm	36.4	36.29	36.12	36.54	35.3	34.15	44.9	34	34.8	35.4	35.9
Cr_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Mn_ppm	38.53	38.1	38.24	37.86	37.39	38.4	40.2	36.4	37.69	38.37	37.7
Mn_IntSE (%)	2%	3%	2%	3%	3%	3%	3%	3%	2%	2%	3%
Co_ppm	35.89	35.2	34.98	34.9	34.5	35.33	35.6	34.37	34.98	35.4	35.16
Co_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Ni_ppm	39	38.4	38.8	40	37.9	37.7	40.8	38.9	38.2	38.5	38.9
Ni_IntSE (%)	4%	4%	4%	4%	4%	5%	4%	5%	4%	4%	4%
Ga_ppm	35.86	36.28	35.67	36.5	35.7	36.46	35.6	36	35.61	36.41	35.92
Ga_IntSE (%)	2%	3%	3%	3%	3%	3%	3%	3%	2%	2%	3%
Rb_ppm	31.77	31.4	31.3	31.7	31.02	32.23	30	30.88	31.83	31.74	31.7
Rb_IntSE (%)	3%	3%	3%	3%	3%	3%	4%	3%	3%	2%	3%
Sr_ppm	78.5	78.2	77.7	79.7	77.7	81.3	75.1	78.4	79	79.4	78.5
Sr_IntSE (%)	2%	3%	3%	3%	2%	3%	3%	3%	3%	2%	3%
Y_ppm	38.2	37.8	37.4	39	37.4	39.4	37	37.2	38.7	38.5	38
Y_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Zr_ppm	38.6	37.7	37.8	38.4	37.6	39.5	36.4	38.3	38.3	38.4	38
Zr_IntSE (%)	4%	4%	3%	4%	3%	4%	3%	4%	3%	3%	4%
Nb_ppm	40.1	39.8	39.7	40.3	39.9	40.8	39	39.7	40.1	40.5	40.2
Nb_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Cs_ppm	42.3	41.6	41.8	42.8	41.7	42.8	41.4	40.7	41.6	43.2	42.3
Cs_IntSE (%)	3%	3%	3%	4%	3%	3%	4%	3%	3%	3%	3%
Ba_ppm	39.8	39.8	39.5	40.1	40.2	41.4	37.5	37.5	41.2	41.3	40.6
Ba_IntSE (%)	3%	4%	4%	4%	3%	3%	4%	3%	4%	4%	3%
La_ppm	36.6	35.5	35.2	36.7	35.9	36.6	34.5	35	35.9	36.65	36.2
La_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Ce_ppm	38.8	38.9	38.3	39	38.8	39.6	37.5	38.5	39	39.1	38.8
Ce_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%
Pr_ppm	37.8	37	36.9	37.3	37.4	38.4	36.5	36.2	37.5	38	37.4
Pr_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Nd_ppm	36.2	35.6	36.4	35.5	35.4	36.9	35.8	35.5	35.1	36.8	36.2
Nd_IntSE (%)	4%	4%	4%	4%	3%	3%	3%	3%	3%	3%	4%
Sm_ppm	38.7	37.8	38	38.3	37.8	39.2	37.4	37.9	37.6	38.7	38.1
Sm_IntSE (%)	4%	4%	3%	4%	3%	4%	3%	4%	4%	3%	4%
Eu_ppm	35.2	34.9	35	34.9	35	35.1	35	34.9	34.9	35	35
Eu_IntSE (%)	4%	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%
Gd_ppm	36.5	37.3	37.4	36.3	36.3	38	36.4	36	36.1	37.5	36.6
Gd_IntSE (%)	4%	5%	3%	4%	4%	4%	4%	4%	4%	4%	4%
Tb_ppm	36.8	35.6	35.9	36.1	35.7	36.8	35.9	35.6	35.3	36.7	36.3
Tb_IntSE (%)	4%	4%	3%	4%	3%	4%	3%	3%	3%	3%	4%
Dy_ppm	36.2	35.9	36.2	35.8	35.9	36.3	35.7	36.1	35.9	36.1	36
Dy_IntSE (%)	4%	4%	4%	4%	3%	4%	4%	4%	3%	3%	4%
Ho_ppm	38	38.1	38	38.2	37.6	38.6	37.9	37.8	37.3	38.6	38
Ho_IntSE (%)	4%	4%	3%	4%	3%	4%	4%	3%	4%	3%	3%
Er_ppm	38.5	38	38.1	38	37.5	39	38.3	37.1	37.4	38.6	38
Er_IntSE (%)	4%	4%	4%	4%	3%	4%	4%	4%	4%	3%	4%
Tm_ppm	38.2	38	38.1	38.1	37.4	38.9	38.3	37.1	37.7	38.5	37.8
Tm_IntSE (%)	4%	4%	4%	4%	3%	4%	3%	4%	4%	3%	4%
Yb_ppm	39.5	39.3	39.2	39.4	38.9	39.6	39.7	38.5	38.5	39.9	38.9
Yb_IntSE (%)	4%	4%	4%	5%	3%	4%	4%	4%	4%	4%	4%
Lu_ppm	37.2	36.8	36.9	37.1	36.5	37.3	36.9	36.8	36.7	37	36.8
Lu_IntSE (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Hf_ppm	35.3	35.1	35.1	35.2	34.9	36.3	34.7	34.3	34.7	35.6	35.1
Hf_IntSE (%)	4%	4%	4%	4%	3%	4%	3%	4%	4%	4%	4%
Ta_ppm	40.4	39.9	40	40.2	39.7	40.3	40.2	39.7	40.1	40	39.9
Ta_IntSE (%)	4%	4%	4%	4%	4%	4%	3%	4%	4%	4%	4%

A3.4. Analyses of the international standards (612 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of silicates and ilmenite. Data given in ppm.

	612_67	612_68	612_69	612_70	612_71	612_72	612_73	612_74	612_75	612_76	612_77
Sc_ppm	41.4	41.1	40.9	40.97	41.1	41	40.96	41	41	40.9	41.19
Sc_IntSE (%)	3%	3%	2%	2%	2%	2%	2%	3%	3%	3%	2%
Ti_ppm	44	44.5	44.3	43.4	46.3	42.1	44.2	45	45.2	40.5	44.6
Ti_IntSE (%)	7%	7%	7%	7%	6%	6%	5%	7%	8%	7%	7%
V_ppm	39.2	38.6	39.2	39.1	38.8	39.3	38.7	39	39.1	39.6	38.7
V_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Cr_ppm	36.48	35.47	36.09	33.7	34.25	35.5	33.64	36.8	36.7	36.13	36.49
Cr_IntSE (%)	3%	3%	2%	3%	3%	3%	3%	3%	3%	3%	3%
Mn_ppm	38.34	37.32	38.74	36.06	37.1	36.33	35.75	37.2	38.2	38.58	38.32
Mn_IntSE (%)	2%	2%	2%	3%	3%	3%	2%	3%	3%	3%	3%
Co_ppm	34.7	34.7	35.4	34.57	34.5	34.5	33.81	35.52	35.09	35.46	35.6
Co_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Ni_ppm	38.4	39.2	38.6	37.7	38.1	38.2	37.8	38.4	39.6	38.9	39.2
Ni_IntSE (%)	5%	4%	4%	5%	4%	4%	4%	4%	4%	4%	4%
Ga_ppm	36.3	35.64	36.19	36.25	35.98	36.42	35.58	35.98	36.3	36.63	35.46
Ga_IntSE (%)	3%	2%	2%	3%	2%	3%	2%	2%	3%	2%	2%
Rb_ppm	31.28	30.9	31.75	30.9	32	32	31.03	31.35	31.55	30.99	31.4
Rb_IntSE (%)	3%	3%	2%	3%	3%	3%	3%	3%	3%	3%	3%
Sr_ppm	78.3	77.8	78.9	78.2	78.9	78.3	78.3	78.8	77.8	78.6	78.2
Sr_IntSE (%)	3%	3%	2%	3%	3%	3%	2%	3%	3%	3%	2%
Y_ppm	38	37.8	38.12	37.9	38.3	37.8	38	38	38	38.3	37.7
Y_IntSE (%)	3%	3%	2%	3%	4%	3%	3%	3%	3%	3%	3%
Zr_ppm	38.5	37.2	38.36	38	38.5	37.4	38.3	38.3	37.8	38.1	38.1
Zr_IntSE (%)	3%	3%	3%	3%	4%	3%	3%	4%	3%	3%	3%
Nb_ppm	39.8	39.6	40.3	39.7	40.8	39.9	39.8	40.6	39.5	40.3	39.5
Nb_IntSE (%)	3%	3%	2%	3%	3%	3%	3%	3%	3%	2%	3%
Cs_ppm	42.5	40.5	42.7	42.1	42.3	42.4	41.4	42.6	41.4	42.5	41.3
Cs_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	4%	3%	3%	3%
Ba_ppm	39	38	40.6	39.8	39.5	39.9	39.6	40.2	39.3	39.6	39.2
Ba_IntSE (%)	4%	4%	3%	4%	4%	4%	3%	4%	4%	3%	4%
La_ppm	35.7	35.2	36.19	35.6	36.6	35.15	35.95	35.6	36	36	35.5
La_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Ce_ppm	38.7	38.4	38.9	38.9	38.4	38.8	38.6	39	38.6	38.9	38
Ce_IntSE (%)	4%	3%	3%	3%	3%	3%	3%	3%	4%	3%	3%
Pr_ppm	37	36.9	37.5	37.1	37.9	36.6	37.4	37.5	36.8	37.8	36.6
Pr_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%
Nd_ppm	35.6	35.8	35.9	36.5	35.8	35.1	36.1	35.8	35.9	36.9	35.6
Nd_IntSE (%)	4%	3%	3%	4%	4%	3%	3%	4%	4%	4%	4%
Sm_ppm	38.1	38	38.2	37.9	38.5	38.3	37.8	37.8	38.3	38.7	37.4
Sm_IntSE (%)	4%	4%	3%	3%	4%	4%	3%	4%	4%	3%	4%
Eu_ppm	35.1	34.9	35	35.3	34.7	34.9	35.1	35	35	35.1	34.1
Eu_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	4%	3%	3%
Gd_ppm	37.1	36.6	36.5	36.5	37.2	36.2	36.9	35.8	37.6	37.5	36
Gd_IntSE (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Tb_ppm	35.8	35.7	36.3	35.9	36.6	35.4	36.2	35.5	36.6	36.4	35.4
Tb_IntSE (%)	3%	3%	3%	4%	4%	3%	3%	4%	4%	4%	3%
Dy_ppm	36	36	36	36	36.4	35.8	35.8	35.7	36.6	36	35.4
Dy_IntSE (%)	4%	3%	4%	4%	4%	4%	4%	4%	4%	3%	4%
Ho_ppm	38.1	37.8	38.1	37.9	38.5	37.7	38	37.5	38.6	37.9	37.8
Ho_IntSE (%)	3%	3%	3%	4%	4%	4%	3%	4%	4%	3%	4%
Er_ppm	38.8	37.4	38.2	37.9	38.6	37.3	38.2	37.5	38.7	38.3	37.2
Er_IntSE (%)	4%	3%	3%	4%	4%	4%	4%	4%	4%	4%	4%
Tm_ppm	38.3	37.9	38	38.1	37.9	37.7	38.3	37.5	38.7	37.9	37.7
Tm_IntSE (%)	3%	3%	3%	4%	4%	4%	4%	4%	4%	3%	3%
Yb_ppm	39.8	38.9	39.2	39.6	39.1	38.4	39.8	38.9	39.5	39.2	38.5
Yb_IntSE (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	3%	4%
Lu_ppm	37.1	36.8	36.9	37.1	36.6	36.9	37	36.6	37.2	37	36.5
Lu_IntSE (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Hf_ppm	35.5	34.4	35.2	35.2	35.1	34.3	35.6	34.6	35.5	35.1	34.5
Hf_IntSE (%)	4%	3%	3%	4%	4%	3%	4%	4%	4%	4%	4%
Ta_ppm	40.2	39.9	40	40.1	40	39.7	40.2	39.3	40.8	40.2	39.7
Ta_IntSE (%)	3%	3%	4%	4%	4%	4%	3%	4%	4%	3%	4%

A3.4. Analyses of the international standards (612 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of silicates and ilmenite. Data given in ppm.

	612_78	612_79	612_80	612_81	612_82	612_83	612_84	612_85	612_86	612_87	612_88
Sc_ppm	40.8	41.1	40.97	40.92	41.15	40.93	41.1	41	40.62	41.8	40.4
Sc_IntSE (%)	2%	3%	2%	2%	2%	2%	3%	3%	2%	3%	2%
Ti_ppm	44.1	43.7	43.3	45	45.7	45.2	43.5	47.6	40.9	45.2	39.5
Ti_IntSE (%)	7%	7%	5%	6%	7%	6%	8%	6%	7%	6%	5%
V_ppm	38.88	39.8	38.2	38.8	38.3	38.87	38.9	39.79	39.5	40.9	36
V_IntSE (%)	2%	3%	3%	3%	3%	3%	3%	2%	3%	3%	3%
Cr_ppm	34.92	35.2	36.27	36.1	36.7	36	36.6	36.7	35	34.6	39.8
Cr_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Mn_ppm	37.42	37.97	38	37.54	37.45	37.67	38	38.01	37.27	38.5	39.63
Mn_IntSE (%)	2%	3%	3%	2%	3%	3%	3%	2%	3%	3%	2%
Co_ppm	34.7	35.8	35.2	34.56	34.7	35.3	34	34.8	35.3	35.4	33.8
Co_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Ni_ppm	39.4	40.4	40.7	38.9	39.2	38	38.4	39.5	36.1	40.7	38.4
Ni_IntSE (%)	4%	5%	4%	4%	4%	5%	6%	4%	5%	4%	4%
Ga_ppm	36.81	36.02	35.6	36.6	35.06	35.3	36.4	36.5	35.87	37.1	35.1
Ga_IntSE (%)	2%	3%	3%	3%	3%	3%	4%	2%	3%	3%	3%
Rb_ppm	31.6	32.1	30.94	31.4	31.6	31.28	31.5	31.22	31.55	32.5	29.8
Rb_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%
Sr_ppm	78.6	79.2	78.1	77.7	78.7	78.6	77.6	78.9	77.2	83.2	73.7
Sr_IntSE (%)	3%	3%	3%	3%	3%	3%	4%	3%	3%	3%	3%
Y_ppm	37.3	39.2	37.7	37.9	38.2	38.1	37.4	38.2	37.4	39.7	35.9
Y_IntSE (%)	3%	4%	3%	3%	3%	3%	3%	3%	3%	3%	4%
Zr_ppm	37.2	38.6	37.8	37.8	38.3	37.9	37.6	38.1	37.5	39.4	36.5
Zr_IntSE (%)	4%	4%	3%	3%	3%	3%	4%	3%	4%	4%	4%
Nb_ppm	39.7	40.8	39.4	40	40.5	39.8	39.6	40.2	39.9	42.6	37.3
Nb_IntSE (%)	3%	3%	3%	3%	3%	3%	4%	3%	3%	4%	3%
Cs_ppm	42.3	43.3	40.8	42.3	41.9	41.5	42.8	43.3	40.9	45	40.5
Cs_IntSE (%)	4%	3%	3%	4%	4%	3%	4%	3%	3%	4%	4%
Ba_ppm	40.9	40.6	39.5	38.3	39.4	40.7	39	40.8	39.2	41.4	37
Ba_IntSE (%)	4%	4%	4%	4%	4%	4%	5%	3%	4%	4%	4%
La_ppm	35.5	36.9	35.2	35.5	35.7	36.2	36	35.1	36.3	38.1	33.5
La_IntSE (%)	4%	4%	3%	4%	3%	4%	4%	3%	4%	3%	3%
Ce_ppm	38.4	40.1	38.1	38.9	38.6	38.5	39.2	39.1	38.1	40.3	37.3
Ce_IntSE (%)	3%	3%	3%	4%	3%	3%	5%	4%	3%	3%	3%
Pr_ppm	37.1	38	36.7	36.7	37.3	37.3	37	37.6	37.3	38.5	36.2
Pr_IntSE (%)	4%	3%	3%	4%	3%	3%	5%	4%	3%	4%	4%
Nd_ppm	35.8	36.2	35.7	34.7	36.1	36.4	35.8	36.7	35.9	37.1	35.2
Nd_IntSE (%)	4%	4%	3%	4%	4%	4%	4%	4%	3%	4%	4%
Sm_ppm	37.8	39.3	37.3	37.9	37.8	39.1	37.7	37.9	37.5	40.3	37.2
Sm_IntSE (%)	4%	4%	3%	4%	4%	4%	5%	4%	4%	4%	4%
Eu_ppm	35.7	36.3	34.6	34.5	35.2	35.1	34.6	35.4	34.8	36.4	34.1
Eu_IntSE (%)	4%	4%	3%	4%	3%	3%	5%	4%	3%	4%	4%
Gd_ppm	36.9	37.2	36.2	36.4	36.6	37.5	35.5	37.2	36.3	38.7	35.4
Gd_IntSE (%)	4%	5%	4%	4%	4%	4%	5%	4%	4%	4%	4%
Tb_ppm	35.6	37.2	35.8	35.1	35.8	36.7	35.4	36.2	36.7	37.4	34.6
Tb_IntSE (%)	4%	4%	3%	4%	4%	4%	4%	4%	4%	4%	4%
Dy_ppm	36.3	37.2	35.3	35.2	36.1	36.3	35.6	37.2	36	37.4	34.5
Dy_IntSE (%)	4%	4%	3%	4%	4%	4%	4%	4%	4%	4%	4%
Ho_ppm	38	39.5	37.2	37.7	37.6	38.8	37.3	38.7	37.9	39.6	36.8
Ho_IntSE (%)	4%	5%	4%	4%	4%	4%	5%	4%	4%	4%	4%
Er_ppm	38.2	39.6	37.3	37.5	37.8	38.9	37.2	38.6	38.4	39.2	36.8
Er_IntSE (%)	4%	5%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Tm_ppm	38.1	39.3	37.3	37.5	37.9	38.6	37.2	38.3	38.6	39.3	36.9
Tm_IntSE (%)	4%	4%	4%	4%	4%	4%	5%	4%	4%	4%	4%
Yb_ppm	39.8	40.3	38.8	38.7	39.1	39.6	39.2	39.4	39.6	39.9	38.2
Yb_IntSE (%)	4%	5%	4%	4%	4%	4%	5%	4%	4%	4%	4%
Lu_ppm	37.2	37.7	36.5	36.1	37.4	37.1	36.3	37.3	36.7	38.5	35.8
Lu_IntSE (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Hf_ppm	35.4	36.1	34.5	34.7	35	35.1	35	35.5	35.1	35.9	34
Hf_IntSE (%)	4%	4%	4%	4%	4%	4%	5%	4%	4%	4%	4%
Ta_ppm	39.9	41	39.5	39.5	40.3	40.1	39.7	40	40.5	40.8	39.3
Ta_IntSE (%)	4%	4%	4%	4%	4%	4%	5%	4%	4%	4%	4%

A3.4. Analyses of the international standards (612 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of silicates and ilmenite. Data given in ppm.

	612_89	612_90	612_91	612_92	612_93	612_94	612_95	612_96	612_97	612_98	612_99
Sc_ppm	41.5	41.09	40.97	41	41	41	41.3	40.81	41.3	41	41.1
Sc_IntSE (%)	3%	2%	2%	3%	2%	3%	3%	2%	3%	2%	3%
Ti_ppm	42.6	48.4	47.8	44.8	42.9	42.9	45	45.9	42	46	43.5
Ti_IntSE (%)	6%	6%	7%	6%	6%	6%	6%	6%	5%	7%	6%
V_ppm	38.7	40.6	38.73	40.04	38.3	38.55	40.7	37.9	38.3	39.3	38.75
V_IntSE (%)	3%	3%	2%	2%	3%	2%	3%	3%	3%	3%	2%
Cr_ppm	34.9	34.6	35.11	36.64	35.94	35.93	35.8	36.07	35.2	35.63	36.6
Cr_IntSE (%)	3%	3%	2%	2%	2%	2%	3%	3%	3%	3%	3%
Mn_ppm	38.3	37.6	37.53	38.5	37.33	38.59	38.9	37.78	37.44	38	37.94
Mn_IntSE (%)	3%	3%	2%	3%	2%	2%	3%	2%	2%	3%	2%
Co_ppm	35.18	34.7	34.38	34.68	34.84	34.5	36.6	34.16	36.03	35.09	35.8
Co_IntSE (%)	3%	3%	3%	3%	2%	2%	3%	2%	2%	3%	3%
Ni_ppm	38.3	39.6	38.6	39.8	36.6	38.6	39.9	38.1	39.2	39.3	38.2
Ni_IntSE (%)	4%	4%	4%	4%	4%	4%	4%	4%	3%	4%	4%
Ga_ppm	36.2	35.2	35.98	35.97	35.94	35.84	37.36	35.33	35.27	36.83	36.17
Ga_IntSE (%)	3%	3%	2%	3%	2%	2%	2%	2%	2%	3%	2%
Rb_ppm	30.96	31.4	32.1	31.3	31.08	31.86	31.84	30.75	30.54	32.73	31.72
Rb_IntSE (%)	3%	4%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Sr_ppm	78	79.8	79.6	77.7	77.8	78.4	80.7	75.1	79.8	79.9	79
Sr_IntSE (%)	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Y_ppm	38.4	38.8	37.9	37.9	37.5	38.2	38.8	36.9	38.5	38.3	37.9
Y_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Zr_ppm	38	38.7	38.3	37.9	37.6	38	39	37.1	38.6	38.3	38.3
Zr_IntSE (%)	3%	3%	3%	3%	3%	3%	4%	3%	4%	3%	3%
Nb_ppm	39.3	40.9	40.8	39.5	39.8	40.7	40.4	38.8	40	40.8	40.4
Nb_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Cs_ppm	41.1	42.3	42	42.1	41.8	42.8	43.3	41	41.9	42	42.7
Cs_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Ba_ppm	40.2	39.9	40.3	39.9	39.4	39.6	40.9	38.6	39.3	40.7	39.4
Ba_IntSE (%)	4%	4%	4%	4%	4%	4%	4%	3%	4%	4%	3%
La_ppm	35.5	36.4	36.4	35.7	36	35.8	36.9	34.33	36	36.5	35.93
La_IntSE (%)	3%	3%	3%	3%	3%	3%	4%	3%	3%	3%	3%
Ce_ppm	38.3	38.9	38.9	39	38.7	38.8	39.3	37	39.1	39.5	38.8
Ce_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Pr_ppm	36.3	37.2	37.8	37.5	36.5	38	38.2	35.7	37.5	37.8	37.6
Pr_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Nd_ppm	35.3	35.7	35.9	36.2	35.8	36.6	36.5	34.9	35.7	36.4	36.7
Nd_IntSE (%)	4%	4%	4%	4%	4%	3%	4%	3%	3%	4%	3%
Sm_ppm	37.6	38.2	38.2	38.3	37.2	39	39	36.6	38.2	38.9	37.9
Sm_IntSE (%)	4%	4%	3%	4%	4%	3%	4%	4%	4%	4%	3%
Eu_ppm	34.3	34.9	35.6	35.3	34.9	35.2	35.6	33.62	35.4	35.6	35.4
Eu_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Gd_ppm	36.7	36.5	36.8	37.2	36.1	37.3	38	35	37	38.1	37
Gd_IntSE (%)	4%	4%	4%	4%	4%	4%	4%	3%	4%	4%	4%
Tb_ppm	35.8	35.7	36.3	36.2	36.1	36.5	36.9	34.4	36.2	36.9	36.3
Tb_IntSE (%)	3%	4%	4%	4%	3%	4%	4%	3%	3%	3%	3%
Dy_ppm	35.7	35.6	36.6	36.5	35.6	36.9	37	34.2	36.4	36.7	36.2
Dy_IntSE (%)	3%	4%	4%	4%	4%	4%	4%	3%	4%	4%	3%
Ho_ppm	37.4	38.1	38.2	38.5	37.6	38.3	39.2	36.4	38.3	38.8	38.5
Ho_IntSE (%)	4%	4%	3%	4%	4%	4%	4%	3%	3%	3%	3%
Er_ppm	37.5	38.7	38	38.4	37.9	38.2	38.7	37.1	37.5	39.1	38.5
Er_IntSE (%)	4%	4%	4%	4%	3%	4%	4%	3%	3%	4%	4%
Tm_ppm	37.3	38.6	38.1	37.9	38.1	38.2	38.6	37.2	37.8	38.7	38.6
Tm_IntSE (%)	4%	4%	3%	4%	3%	4%	4%	3%	3%	4%	4%
Yb_ppm	38.9	38.8	39.8	39.6	38.8	39.2	40.2	38.4	38.8	40.2	39.4
Yb_IntSE (%)	4%	4%	4%	4%	4%	4%	4%	3%	4%	4%	4%
Lu_ppm	36.7	36.9	37.3	36.9	36.8	37.3	37.2	36.3	36.4	37.8	37.1
Lu_IntSE (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	3%	4%
Hf_ppm	34.6	35.3	35.3	35	35	35.2	35.6	34.7	34.2	35.7	35.3
Hf_IntSE (%)	4%	4%	4%	4%	4%	4%	4%	3%	4%	4%	4%
Ta_ppm	40	39.9	39.9	40.1	39.7	40	41	39.7	39.5	40.5	40.3
Ta_IntSE (%)	4%	4%	4%	3%	4%	4%	4%	3%	3%	4%	3%

A3.4. Analyses of the international standards (612 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of silicates and ilmenite. Data given in ppm.

	612_100	612_101	612_102	612_103	612_104	612_105	612_106	612_107	612_108	612_109	612_110
Sc_ppm	40.9	40.87	41.1	41.4	40.53	41.3	41.02	41.13	40.64	41.3	40.9
Sc_IntSE (%)	3%	2%	3%	3%	2%	3%	2%	2%	2%	3%	3%
Ti_ppm	45.6	45	44.2	41.4	40.4	47.6	44.9	42.9	44.8	43.7	44.2
Ti_IntSE (%)	7%	6%	7%	7%	6%	5%	6%	7%	6%	6%	7%
V_ppm	38.53	40.33	38.97	42.8	35.9	39.2	38.87	39.07	38.52	39.42	38.9
V_IntSE (%)	3%	2%	3%	3%	3%	3%	2%	2%	2%	2%	3%
Cr_ppm	36.8	37.6	34.7	85.8	35.81	35.35	36.05	36.2	36.29	36.72	36.83
Cr_IntSE (%)	3%	2%	3%	3%	3%	3%	3%	3%	3%	3%	2%
Mn_ppm	38.53	39.03	37.03	61.5	36.47	38.19	39.33	37.87	38.56	38.95	38.44
Mn_IntSE (%)	2%	2%	2%	2%	3%	2%	2%	2%	3%	2%	2%
Co_ppm	34.9	35.6	34.94	42.6	34.7	34.91	35.19	35	35.6	36.12	35.26
Co_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Ni_ppm	38.6	38.7	38	53.2	39.5	39.1	39.6	38.1	36.9	39.8	38.5
Ni_IntSE (%)	5%	4%	4%	5%	4%	4%	4%	3%	5%	4%	4%
Ga_ppm	35.42	36.54	35.59	42.5	33.66	35.63	36.98	35.64	35.81	36.29	35.37
Ga_IntSE (%)	3%	2%	2%	3%	3%	2%	2%	2%	2%	2%	2%
Rb_ppm	30.85	31.82	31.29	36	28.87	32	32.13	31.18	31.18	31.38	31.48
Rb_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%
Sr_ppm	75.6	81	78.6	85.7	72.8	82.1	78.6	78.1	78.4	78.6	77.8
Sr_IntSE (%)	3%	2%	3%	3%	2%	3%	2%	2%	3%	2%	3%
Y_ppm	37.7	38.4	37.9	40.1	36.5	38.7	38.1	37.94	37.6	38.3	38.2
Y_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%
Zr_ppm	37	39.1	37.7	40.5	36	38.9	38.3	37.8	37.9	38.1	38.2
Zr_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%
Nb_ppm	38.7	41.1	40.1	42.4	37.3	41.2	40.4	39.6	39.5	40.6	40
Nb_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Cs_ppm	41.3	42.5	42.2	49.3	38.3	41.4	42.8	41.5	41.8	43.1	42.2
Cs_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	2%	3%	3%	3%
Ba_ppm	38.8	42.1	39.6	44	36.8	40.9	40.2	39.3	39.7	40.1	40.5
Ba_IntSE (%)	3%	4%	4%	4%	3%	3%	3%	3%	4%	3%	3%
La_ppm	35.1	36.7	36.1	38.1	33.36	36.93	35.6	36.1	35.6	36.07	35.43
La_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Ce_ppm	38.1	39.6	38.4	42.9	35.8	38.9	38.7	38.7	38.2	39.3	38.4
Ce_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Pr_ppm	36.4	37.9	36.9	43	34.72	37.1	37.1	37.6	37.5	37.19	37.1
Pr_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Nd_ppm	34.4	36.7	36	41.3	33.6	35.4	36.1	36.3	36	35.9	36.1
Nd_IntSE (%)	3%	4%	3%	4%	3%	4%	3%	4%	3%	3%	3%
Sm_ppm	37.5	38.5	38.3	43.8	35.4	37.6	38.1	38.3	38	38.6	37.7
Sm_IntSE (%)	4%	3%	4%	4%	3%	3%	4%	4%	3%	3%	4%
Eu_ppm	34.3	35.4	34.8	41.6	32.32	34.9	34.9	35.4	34.9	35.2	34.9
Eu_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%
Gd_ppm	35.6	36.7	37.8	42.6	34.2	36.6	36.9	36.5	37	37	36.6
Gd_IntSE (%)	4%	4%	4%	4%	3%	4%	4%	4%	4%	4%	4%
Tb_ppm	35.3	36.2	36	42.6	33.3	35	36.2	36.3	35.6	36.6	35.9
Tb_IntSE (%)	3%	3%	3%	4%	3%	3%	4%	4%	3%	3%	3%
Dy_ppm	35.2	36	36.4	43.8	33	34.7	36.2	36	36.2	36.5	36
Dy_IntSE (%)	4%	4%	4%	4%	3%	4%	4%	4%	4%	4%	4%
Ho_ppm	37.2	38.3	37.6	45.5	34.9	37.1	37.6	38.7	38.3	38	37.7
Ho_IntSE (%)	3%	3%	3%	4%	3%	4%	3%	3%	3%	3%	3%
Er_ppm	37	38.4	38.4	45.8	34.9	37.9	37.8	38.6	38.1	38.1	38.2
Er_IntSE (%)	3%	4%	4%	4%	3%	4%	4%	4%	3%	3%	4%
Tm_ppm	37.2	37.7	38.1	45.4	35.2	37.4	37.9	38.3	37.7	38.7	37.6
Tm_IntSE (%)	4%	3%	3%	4%	3%	4%	4%	4%	3%	4%	3%
Yb_ppm	38.9	38.7	39.5	48.5	36.1	38.7	39.2	39.5	39.7	39	39.2
Yb_IntSE (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Lu_ppm	36.3	36.9	36.9	44.5	34.1	36.4	37.1	36.9	36.7	37.4	36.8
Lu_IntSE (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	3%	4%
Hf_ppm	34.3	35.3	35	42.2	32.5	34.6	35.2	35.4	34.9	35.2	35.2
Hf_IntSE (%)	4%	4%	3%	5%	3%	4%	4%	4%	3%	4%	4%
Ta_ppm	39.2	40.7	39.4	48.1	37.1	39	39.9	40.6	40.2	39.9	40.1
Ta_IntSE (%)	4%	4%	3%	4%	4%	4%	4%	3%	3%	4%	3%

A3.4. Analyses of the international standards (612 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of silicates and ilmenite. Data given in ppm.

	612_111	612_112	612_113	612_114	612_115	612_116	612_117	612_118	612_119	612_120	612_121
Sc_ppm	41.2	40.78	41.16	40.85	41.12	40.8	41.3	40.81	41.3	40.62	41.59
Sc_IntSE (%)	3%	2%	2%	2%	2%	3%	3%	2%	3%	2%	2%
Ti_ppm	42.1	42.9	47.8	43.6	44	43.4	43.9	46	45.7	42.2	41.7
Ti_IntSE (%)	6%	7%	6%	6%	6%	6%	7%	6%	6%	6%	6%
V_ppm	38.93	39.59	38.6	38.33	39.66	39.63	39.42	38.55	40.55	36.8	37.65
V_IntSE (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%
Cr_ppm	37.04	37.94	37.5	36.29	36.36	37.16	36.25	36.14	36.7	36.24	33.2
Cr_IntSE (%)	2%	2%	3%	2%	3%	3%	2%	2%	3%	3%	3%
Mn_ppm	38.63	38.9	38.69	38.74	38.5	39.24	38.89	37.52	38.65	37.99	36.93
Mn_IntSE (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	3%
Co_ppm	35.68	34.97	35.32	35.7	34.33	34.64	34.59	34.33	36.02	34.44	33.8
Co_IntSE (%)	2%	3%	3%	2%	2%	3%	3%	2%	2%	3%	3%
Ni_ppm	38.4	38.9	39.2	37.5	39.3	37.2	37.6	36.9	37.4	39.1	37.2
Ni_IntSE (%)	4%	4%	5%	4%	5%	4%	4%	4%	4%	4%	4%
Ga_ppm	36.29	35.74	36.08	36.58	36.02	35.69	36.39	36.19	36.51	35.01	35.51
Ga_IntSE (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Rb_ppm	30.99	31.6	31.72	31.6	31.18	31.14	30.78	32.1	32.59	29.91	30.71
Rb_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	2%	3%	3%	3%
Sr_ppm	78.4	79.3	78.4	78.5	78.2	77.8	78.3	78.7	80	76.2	77.6
Sr_IntSE (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	3%	3%
Y_ppm	37.9	37.7	38.3	38.03	38	37.72	38.2	38.01	38.5	37.3	38.4
Y_IntSE (%)	3%	3%	3%	2%	3%	3%	3%	3%	3%	3%	3%
Zr_ppm	37.9	37.8	38.2	38.2	37.7	38	37.9	37.7	39	37	38.7
Zr_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Nb_ppm	39.73	39.9	40.4	39.73	40.3	39.8	39.67	40.2	41.4	38	39.4
Nb_IntSE (%)	2%	3%	3%	2%	3%	3%	2%	2%	3%	3%	3%
Cs_ppm	41.9	41.4	42.3	41.7	42.3	42.1	42	42.2	44	39.4	40.2
Cs_IntSE (%)	3%	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Ba_ppm	38.6	39.2	40.5	40	39.3	40.1	39.3	39.5	41.1	37.6	40.1
Ba_IntSE (%)	3%	3%	3%	4%	4%	3%	3%	3%	3%	3%	3%
La_ppm	36.13	35.4	36.2	35.65	35.8	35.7	35.5	36.2	37	34	35.5
La_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	2%	3%	3%	3%
Ce_ppm	38.5	38.7	39.2	38.9	38.4	38.5	38.08	39.5	39.8	37.4	38.1
Ce_IntSE (%)	3%	3%	3%	3%	3%	3%	2%	3%	3%	3%	3%
Pr_ppm	37	36.9	37.8	37.2	37.2	36.8	37.08	37.57	38.3	35.5	36.7
Pr_IntSE (%)	3%	3%	3%	3%	3%	3%	2%	3%	3%	3%	3%
Nd_ppm	35.3	36.2	35.9	35.7	35.9	35.9	35.7	36.2	37	34.1	35.8
Nd_IntSE (%)	3%	4%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Sm_ppm	38.3	37.4	39.2	38.5	37.4	38.2	38.1	38.2	39	37.1	38.1
Sm_IntSE (%)	4%	3%	4%	4%	4%	3%	3%	3%	4%	4%	3%
Eu_ppm	34.63	35.1	35.5	34.8	35.1	34.6	35.14	35.07	36	33.4	34.8
Eu_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Gd_ppm	36.7	36.5	36.9	37.2	36.2	36.7	36.3	37.4	37.5	35.1	36.5
Gd_IntSE (%)	4%	4%	4%	3%	4%	3%	3%	3%	3%	4%	4%
Tb_ppm	35.8	35.6	36.7	35.7	36.2	35.9	36.17	36.2	36.7	34.9	35.8
Tb_IntSE (%)	3%	3%	3%	3%	4%	3%	3%	3%	3%	3%	3%
Dy_ppm	35.6	36	36.3	35.8	36.1	35.3	36.7	36.9	36.3	35.4	35.4
Dy_IntSE (%)	3%	4%	3%	3%	4%	3%	3%	3%	4%	3%	3%
Ho_ppm	37.6	38.4	38.4	37.6	38.3	38	38	38.6	38.5	37	37.9
Ho_IntSE (%)	3%	4%	3%	3%	4%	3%	3%	3%	4%	4%	3%
Er_ppm	37.4	38	38.4	37.8	38.2	37.5	37.6	39.4	39	36.9	37.5
Er_IntSE (%)	3%	3%	4%	3%	4%	3%	3%	3%	4%	4%	4%
Tm_ppm	38.1	37.7	38.4	37.7	38.3	37.3	38.1	38.6	38.8	37.5	37.6
Tm_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	4%	3%	3%
Yb_ppm	38.9	39	39.6	38.8	39.8	38.8	38.9	40.5	39.8	38.8	38.8
Yb_IntSE (%)	3%	4%	4%	3%	4%	3%	3%	4%	4%	4%	4%
Lu_ppm	37	36.3	37.4	36.6	37.2	36.4	37.1	37.5	37.9	35.7	36.9
Lu_IntSE (%)	4%	4%	3%	3%	4%	3%	3%	3%	4%	3%	3%
Hf_ppm	34.6	34.9	35.2	34.9	35.1	34.7	34.8	35.7	36	34.1	35
Hf_IntSE (%)	3%	4%	3%	3%	3%	3%	3%	3%	4%	4%	3%
Ta_ppm	39.7	39.7	40.5	39.7	40.4	39.7	40.1	40.4	40.7	39.4	39.7
Ta_IntSE (%)	3%	4%	3%	3%	3%	4%	3%	3%	4%	4%	4%

A3.4. Analyses of the international standards (612 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of silicates and ilmenite. Data given in ppm.

	612_122	612_123	612_124	612_125	612_126	612_127	612_128	612_129	612_130	612_131	612_132
Sc_ppm	40.6	41.21	40.87	41.14	40.8	41.2	40.79	41.01	41.17	40.83	41.32
Sc_IntSE (%)	2%	2%	2%	2%	3%	3%	2%	2%	2%	2%	2%
Ti_ppm	44.9	44.1	46	44.5	45.4	44.8	40.6	43.2	44.2	44.6	44.7
Ti_IntSE (%)	6%	6%	5%	5%	6%	7%	6%	5%	6%	5%	6%
V_ppm	38.2	39.67	40.16	39.79	40.1	41.1	38.75	37.71	37.21	38.6	39.8
V_IntSE (%)	3%	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%
Cr_ppm	35.36	36.9	35.56	36.93	36.23	34.2	50.3	34.66	32.29	33.5	35.71
Cr_IntSE (%)	3%	3%	3%	3%	2%	3%	2%	3%	3%	2%	2%
Mn_ppm	37.06	38.43	38.53	38.92	38.4	36.43	44.97	36.83	35.22	35.74	37.97
Mn_IntSE (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Co_ppm	33.91	34.92	34.92	35.49	35.12	34.53	36.8	34.66	34.15	34.76	33.87
Co_IntSE (%)	3%	2%	2%	3%	2%	2%	3%	2%	2%	2%	2%
Ni_ppm	37	42.3	38.9	38.9	39.9	38.3	42.3	39.2	39	37.5	39.4
Ni_IntSE (%)	4%	4%	4%	4%	4%	4%	3%	4%	4%	4%	3%
Ga_ppm	34.94	36.52	36.39	36.57	37.01	36.4	37.14	35.65	35.05	34.71	36.34
Ga_IntSE (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Rb_ppm	31.53	32.23	31.32	31.19	31.66	31.47	32.41	30.52	31.06	31.73	31.23
Rb_IntSE (%)	3%	2%	3%	3%	2%	3%	3%	3%	2%	3%	2%
Sr_ppm	79	79.1	78.1	78	79.5	78.4	78.9	76.5	78.7	79.1	77.8
Sr_IntSE (%)	2%	2%	2%	3%	2%	2%	3%	2%	2%	2%	2%
Y_ppm	37.8	38.3	38.1	37.2	38.49	38.3	37.9	37.63	38.16	38.13	38
Y_IntSE (%)	3%	3%	3%	3%	2%	3%	3%	2%	2%	2%	3%
Zr_ppm	37.8	38.3	37.6	38	38.5	38.1	38.1	37.14	38.5	38.1	37.9
Zr_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Nb_ppm	40.7	40.6	39.5	40.2	41.3	39.6	39.2	39.87	40.04	40.26	40
Nb_IntSE (%)	3%	3%	3%	3%	2%	3%	3%	2%	2%	2%	3%
Cs_ppm	42.2	43.1	41.9	42.8	42.4	41.7	43.6	41.8	40.3	41.7	42.5
Cs_IntSE (%)	3%	3%	3%	3%	2%	3%	3%	2%	3%	3%	3%
Ba_ppm	39.2	40.6	39.4	40.1	40	39.8	39.4	39.2	38.9	41.1	39.2
Ba_IntSE (%)	4%	3%	3%	3%	3%	3%	4%	3%	3%	3%	3%
La_ppm	36.05	36.5	35.3	36	36.53	35.7	35.7	35.16	35.6	36.46	35.61
La_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	2%	3%	3%	3%
Ce_ppm	38.4	39.8	38.7	38.4	39.1	38.7	39.1	38.31	38.6	38.71	38.3
Ce_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	2%	3%	2%	3%
Pr_ppm	37.6	37.5	37.06	37.2	38.2	36.52	39.1	36.25	36.78	37.4	37.4
Pr_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	2%	2%	3%	3%
Nd_ppm	36	36.4	36.1	35.9	37.5	34.7	37.7	35.46	35.3	35.7	35.6
Nd_IntSE (%)	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%	3%
Sm_ppm	37.7	38.9	38.2	38.2	38.7	37.2	40.2	37.2	37.9	37.9	37.9
Sm_IntSE (%)	3%	4%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Eu_ppm	35.5	35.3	34.5	35.2	35.6	34.5	37.4	34.24	34.28	35.1	35.1
Eu_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Gd_ppm	37	37.1	36.9	36.2	37.8	36.2	38.4	35.5	36.6	36.9	36.6
Gd_IntSE (%)	4%	4%	3%	3%	4%	4%	3%	3%	3%	4%	4%
Tb_ppm	35.6	36.6	35.6	36	37.1	35.3	38.3	34.89	35.4	35.8	36.1
Tb_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%
Dy_ppm	35.8	36.4	35.9	35.8	37.3	35	39.2	35.4	34.9	35.5	36
Dy_IntSE (%)	3%	4%	3%	4%	3%	4%	3%	3%	3%	3%	4%
Ho_ppm	37.7	38.4	37.8	38	38.9	37.3	40.8	37.1	37.2	37.7	37.8
Ho_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Er_ppm	37.6	38.8	37.8	38.4	38.4	37.3	41.2	36.8	37	38	38
Er_IntSE (%)	4%	4%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Tm_ppm	37.6	38.4	37.8	37.6	39.2	37	40.4	36.9	37.2	38	38.3
Tm_IntSE (%)	4%	3%	3%	3%	3%	4%	3%	3%	3%	3%	4%
Yb_ppm	38.9	39.7	39.2	39.4	38.9	38.5	42.9	38.1	38.2	39	39.1
Yb_IntSE (%)	4%	4%	4%	3%	4%	4%	3%	3%	3%	4%	4%
Lu_ppm	36.6	37.8	36.7	37.2	37.3	35.8	39.7	35.9	36.1	37.2	36.8
Lu_IntSE (%)	4%	4%	3%	3%	3%	4%	3%	3%	3%	3%	4%
Hf_ppm	34.5	35.5	34.9	35.2	35.1	34.7	37.5	34.11	34.2	35	35.3
Hf_IntSE (%)	4%	4%	3%	4%	3%	4%	3%	3%	3%	3%	4%
Ta_ppm	39.9	40.4	39.8	40.5	40.1	39.3	42.5	39.7	38.9	40.2	40.3
Ta_IntSE (%)	4%	3%	3%	3%	3%	4%	3%	3%	3%	3%	4%

A3.4. Analyses of the international standards (612 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of silicates and ilmenite. Data given in ppm.

	612_133	612_134	612_135	612_136	612_137	612_138	612_139	612_140	612_141	612_142	612_143
Sc_ppm	40.67	40.85	41.25	40.92	40.6	41.5	40.92	41.4	40.29	41.9	41
Sc_IntSE (%)	2%	2%	2%	2%	2%	3%	2%	3%	2%	3%	2%
Ti_ppm	45.1	44.3	43.1	43.8	41.7	48	42.2	42	43.7	47.5	42.9
Ti_IntSE (%)	6%	6%	6%	6%	6%	5%	6%	6%	6%	5%	6%
V_ppm	38.85	38.05	39.81	38.49	38.2	39.7	39.6	38.41	39.93	39.9	38.5
V_IntSE (%)	2%	2%	2%	2%	3%	3%	3%	3%	2%	3%	3%
Cr_ppm	34.95	35.11	34.83	35.22	33.87	35.6	35.56	36.4	36.7	37	36.03
Cr_IntSE (%)	2%	3%	3%	2%	3%	3%	3%	3%	3%	3%	3%
Mn_ppm	37.23	36.79	37.4	36.23	36.17	37.41	38.06	38.15	39	39.2	37.71
Mn_IntSE (%)	2%	2%	2%	3%	3%	3%	2%	3%	3%	3%	2%
Co_ppm	33.94	34.74	35.5	34	33.8	35.3	34.9	35.4	35.94	36.6	35.35
Co_IntSE (%)	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Ni_ppm	37.3	37.3	38.3	39.2	38.9	38.9	37.8	38.4	38.3	41.1	38.8
Ni_IntSE (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Ga_ppm	35.72	36.49	36.43	35.09	35.54	35.86	35.76	36.42	35.72	38.29	35.64
Ga_IntSE (%)	2%	2%	2%	2%	3%	2%	3%	2%	3%	3%	2%
Rb_ppm	31.86	30.89	32.47	30.13	31.7	32.2	31.4	31	31.73	31.95	30.93
Rb_IntSE (%)	3%	3%	3%	2%	3%	3%	3%	3%	3%	3%	3%
Sr_ppm	78.6	78.6	79.7	75.6	79.9	80.1	77.7	78.7	77	80.6	78.1
Sr_IntSE (%)	2%	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Y_ppm	38	37.56	38.9	37.2	38.3	38.7	37.7	38.1	37.3	38.9	38.1
Y_IntSE (%)	3%	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Zr_ppm	37.8	38.1	38.7	37.1	38.5	38.8	37.6	38.5	37.2	38.8	38
Zr_IntSE (%)	3%	3%	3%	3%	4%	3%	3%	3%	3%	4%	3%
Nb_ppm	40.1	40	40.8	38.3	39.8	41.2	40	39.9	39.2	41.4	39.2
Nb_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Cs_ppm	42.6	41.8	42.7	40.2	41.6	42.3	42.4	42.1	41.6	43.5	41.2
Cs_IntSE (%)	3%	3%	3%	3%	4%	3%	4%	3%	3%	3%	3%
Ba_ppm	39.7	40.1	40.6	38	40.1	40.4	39.6	39.9	39	40.8	40
Ba_IntSE (%)	3%	3%	3%	3%	4%	4%	4%	4%	4%	3%	4%
La_ppm	35.9	35.8	36.9	33.9	35.9	37.1	35.5	36.1	35.1	37.1	35.2
La_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Ce_ppm	39.3	38.7	39.3	37.1	38.3	39.7	38.1	39.6	38	39.5	38.1
Ce_IntSE (%)	3%	3%	3%	3%	4%	3%	3%	3%	3%	3%	3%
Pr_ppm	37.32	37	38.1	35.7	36.9	38.2	36.7	38.1	36.5	38.7	36.5
Pr_IntSE (%)	3%	3%	3%	3%	4%	3%	3%	3%	3%	3%	3%
Nd_ppm	36.8	35.8	36.9	34.1	36.4	36.6	35.5	36.7	35.5	37.4	35.5
Nd_IntSE (%)	3%	3%	4%	3%	4%	4%	3%	4%	4%	3%	3%
Sm_ppm	38.6	38	39.1	36.6	38.4	38.7	38.3	38.2	37.3	39.2	37.6
Sm_IntSE (%)	4%	3%	3%	3%	4%	3%	4%	4%	4%	3%	4%
Eu_ppm	35.2	34.8	35.8	33.4	35.1	35.8	34.7	35.6	34.3	35.8	34.6
Eu_IntSE (%)	3%	3%	3%	3%	3%	3%	4%	3%	4%	3%	3%
Gd_ppm	36.9	36.2	38.2	35.4	36.3	37.3	36.4	37.1	36.8	37.5	36.5
Gd_IntSE (%)	3%	3%	3%	3%	4%	3%	4%	4%	4%	4%	4%
Tb_ppm	36.3	35.3	37.5	34.7	35.6	36.4	36	36.4	35.7	37.3	35.3
Tb_IntSE (%)	3%	3%	3%	3%	4%	3%	4%	4%	4%	3%	3%
Dy_ppm	36.5	35.6	37.8	34.2	36	36.8	35.7	36.2	36.1	37	35.6
Dy_IntSE (%)	3%	4%	3%	3%	4%	4%	4%	4%	4%	4%	4%
Ho_ppm	38.4	37.8	39.2	36.5	37.1	38.8	37.7	38.5	38	38.9	37.9
Ho_IntSE (%)	3%	3%	3%	3%	4%	3%	3%	3%	4%	4%	4%
Er_ppm	37.9	37.8	39.7	36.4	37.6	38.7	37.4	38.4	37.7	39.6	37.2
Er_IntSE (%)	4%	3%	3%	3%	4%	3%	4%	3%	4%	4%	4%
Tm_ppm	37.7	37.7	39.5	36.9	37.3	38.8	37.5	38.2	38	39.1	37.4
Tm_IntSE (%)	3%	3%	3%	3%	4%	4%	4%	3%	4%	4%	3%
Yb_ppm	39.5	38.8	40.7	38	38.9	39.6	39	39.7	39	40	38.4
Yb_IntSE (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Lu_ppm	37	36.2	38.5	35.7	36.4	37.6	36.3	37.4	36.5	37.9	36.8
Lu_IntSE (%)	3%	4%	3%	4%	4%	3%	4%	3%	4%	4%	4%
Hf_ppm	34.6	35.1	36.6	33.7	34.2	35.8	34.7	35.4	34.9	36.3	34.6
Hf_IntSE (%)	3%	3%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Ta_ppm	39.8	39.6	41.5	38.8	39.4	40.8	39.7	40.2	39.9	40.9	39.4
Ta_IntSE (%)	3%	4%	4%	3%	4%	4%	4%	3%	4%	4%	4%

A3.4. Analyses of the international standards (612 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of silicates and ilmenite. Data given in ppm.

	612_144	612_145	612_146	612_147	612_148	612_149	612_150	612_151	612_152	612_153	612_154
Sc_ppm	40.8	41.2	40.93	41.1	41.12	40.7	41.1	41.24	40.39	41.66	40.8
Sc_IntSE (%)	2%	2%	2%	3%	2%	2%	3%	2%	2%	2%	2%
Ti_ppm	45.1	43.7	42.8	44.4	46	44.1	42.6	47.4	41.5	45.2	44.2
Ti_IntSE (%)	5%	7%	6%	5%	6%	6%	6%	6%	6%	6%	6%
V_ppm	38.21	39.7	37.76	39.9	39.22	39.13	38.85	39.03	38.78	39.61	38.71
V_IntSE (%)	3%	3%	3%	3%	2%	3%	2%	2%	2%	2%	2%
Cr_ppm	34.95	36.8	36.2	37.9	36.72	34.96	33.9	35.21	34.47	36.19	35.39
Cr_IntSE (%)	2%	3%	3%	4%	3%	3%	3%	2%	2%	2%	2%
Mn_ppm	36.9	38.4	37.26	39.3	37.83	37.58	37.13	38.13	37.7	38.42	37.84
Mn_IntSE (%)	2%	3%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Co_ppm	34.7	36.1	34.4	35.9	34.88	34.88	35.36	34.83	34.81	35.36	35.09
Co_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%
Ni_ppm	37.9	39.6	37.9	39.2	39.7	38.3	39.9	37.7	40.7	38.3	37.4
Ni_IntSE (%)	4%	4%	4%	4%	4%	4%	4%	3%	4%	4%	4%
Ga_ppm	35.13	36.29	35.37	37	36.15	35.68	36.24	36.28	35.59	36.25	36.04
Ga_IntSE (%)	3%	3%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Rb_ppm	31.3	31.65	30.69	32.6	31.12	31.5	31.56	31.42	31.34	31.44	31.42
Rb_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	2%	2%	3%
Sr_ppm	76.8	80.4	77.1	80.8	78.3	77.8	78.8	78.8	77.6	79.1	78.3
Sr_IntSE (%)	3%	3%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Y_ppm	37	38.8	37.76	38.3	37.9	38.2	37.9	38.15	37.65	38.3	37.93
Y_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	2%
Zr_ppm	37.6	38.3	37.8	38.3	37.8	38.3	38	38	37.8	38.6	37.8
Zr_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%
Nb_ppm	39.7	40.9	39.5	40.6	40	40.1	39.9	40.07	39.75	40.3	39.92
Nb_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%
Cs_ppm	41.3	43	40.6	43.9	42.4	41.4	42.3	41.96	42	42	42
Cs_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	2%	3%	2%	3%
Ba_ppm	38.2	40.4	39	40.7	40	38.6	40.5	39.8	39.4	39.9	39.7
Ba_IntSE (%)	4%	3%	4%	4%	4%	4%	3%	3%	3%	3%	3%
La_ppm	35.4	36.5	35.5	36.1	35.8	35.8	35.8	35.9	35.57	35.94	35.81
La_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	2%	2%	3%	2%
Ce_ppm	38.4	39.2	38	39.4	38.7	38.8	38.6	38.92	38.14	39.2	38.7
Ce_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	2%	2%	3%	3%
Pr_ppm	36.4	38	36.8	37.8	37	37.7	37	37.3	36.88	37.5	37.3
Pr_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	2%	3%	3%
Nd_ppm	35.4	36.2	36.5	35.5	35.7	36.3	35.8	36.2	35.3	36.5	35.9
Nd_IntSE (%)	3%	4%	4%	4%	3%	4%	3%	3%	3%	3%	3%
Sm_ppm	37.7	38.4	37.9	38.5	37.8	38	38.5	37.9	37.5	38.5	38.4
Sm_IntSE (%)	4%	3%	4%	4%	3%	4%	4%	3%	3%	3%	3%
Eu_ppm	34.3	35.9	34.7	35.4	34.8	35.3	34.9	34.9	35.02	35.27	34.85
Eu_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%
Gd_ppm	36	37.2	36.4	37.4	37	35.4	37.2	36.8	36.2	37.5	36.4
Gd_IntSE (%)	4%	4%	3%	4%	4%	4%	3%	3%	3%	3%	4%
Tb_ppm	35.6	36.4	36.1	36	35.9	35.9	36.2	36.11	35.69	36.5	35.8
Tb_IntSE (%)	4%	3%	4%	4%	3%	4%	3%	3%	3%	3%	3%
Dy_ppm	35.7	36	35.7	36.5	36.1	35.7	36.1	36.4	35.1	36.9	35.8
Dy_IntSE (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	3%	3%
Ho_ppm	37.6	38	37.9	38.2	38	37.9	38.1	38.1	37.6	38.6	37.8
Ho_IntSE (%)	4%	3%	3%	3%	4%	4%	3%	3%	3%	3%	3%
Er_ppm	37.8	38.4	37.7	38.5	37.6	37.9	38.3	37.9	38.2	37.7	38.1
Er_IntSE (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	3%	3%
Tm_ppm	37.9	38.2	37.9	38.3	38.1	37.5	38.4	38.1	37.7	38.3	37.9
Tm_IntSE (%)	4%	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%
Yb_ppm	39.1	39.6	39.7	38.7	39.2	38.9	39.7	39.4	38.7	39.8	39.1
Yb_IntSE (%)	4%	4%	4%	4%	4%	4%	4%	3%	3%	3%	3%
Lu_ppm	36.5	37	37.1	36.8	36.5	37.2	37.1	37.2	36.5	37.3	36.7
Lu_IntSE (%)	4%	4%	4%	4%	4%	4%	4%	3%	3%	3%	3%
Hf_ppm	34.7	35.1	35.1	35.1	34.8	34.9	35.2	35	34.8	35.4	34.86
Hf_IntSE (%)	4%	3%	4%	4%	3%	4%	3%	3%	3%	3%	3%
Ta_ppm	40.4	39.9	39.7	40.5	40	39.4	40.5	40	39.6	40.9	39.5
Ta_IntSE (%)	4%	4%	4%	4%	4%	3%	3%	3%	3%	3%	3%

A3.4. Analyses of the international standards (612 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of silicates and ilmenite. Data given in ppm.

	612_155	612_156	612_157	612_158	612_159	612_160	612_161	612_162	612_163	612_164	612_165
Sc_ppm	40.98	40.93	41.16	41.14	40.1	41.91	40.63	41.5	41.14	40.4	41.41
Sc_IntSE (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Ti_ppm	44.4	42.1	43.4	43.1	43.3	40.6	46	47.5	45.9	45.5	43.7
Ti_IntSE (%)	6%	7%	7%	6%	5%	6%	7%	5%	7%	7%	6%
V_ppm	38.96	39.27	38.49	39.31	38.9	38.97	38.82	39.12	38.98	38.9	39.18
V_IntSE (%)	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%
Cr_ppm	35.31	35.99	35.72	33.71	43.6	34.92	35.47	36.41	35.48	36.68	36.41
Cr_IntSE (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	3%	3%
Mn_ppm	37.91	38.73	37.54	37.37	40.79	36.68	37.68	37.93	37.86	37.09	38.64
Mn_IntSE (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Co_ppm	35.11	34.71	34.84	34.97	36.1	34.45	35.29	34.81	34.89	34.32	35.42
Co_IntSE (%)	3%	2%	2%	2%	2%	2%	3%	2%	3%	2%	2%
Ni_ppm	38.9	39.8	39.6	37.1	41.4	39.1	40.4	38.8	38.1	37.8	39.6
Ni_IntSE (%)	4%	4%	4%	4%	3%	4%	3%	4%	4%	4%	4%
Ga_ppm	35.97	35.79	36.55	35.56	36.67	35.33	35.97	36.16	35.75	36.29	35.89
Ga_IntSE (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Rb_ppm	31.24	31.6	31.5	31.31	31.67	30.95	31.43	31.49	31.26	31.42	31.85
Rb_IntSE (%)	2%	3%	3%	2%	3%	3%	2%	2%	2%	3%	3%
Sr_ppm	77.9	79.3	78	78.5	78	79	78	78.6	78.2	78.3	78.7
Sr_IntSE (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Y_ppm	37.96	38.08	38.1	37.93	37.8	38.2	38.02	38.03	37.97	37.8	38.2
Y_IntSE (%)	3%	3%	3%	2%	2%	3%	3%	3%	3%	3%	3%
Zr_ppm	37.8	38.5	37.6	38.2	37.71	38.4	38	38	38.1	37.9	38.3
Zr_IntSE (%)	3%	3%	3%	3%	2%	3%	3%	3%	3%	3%	3%
Nb_ppm	39.98	39.93	40.17	39.96	39.86	40.3	39.94	40.1	40	40	40.2
Nb_IntSE (%)	2%	2%	2%	2%	2%	3%	2%	3%	3%	3%	3%
Cs_ppm	41.7	42.5	42.4	41.6	42.2	41.7	42.1	42	41.8	42.1	42.2
Cs_IntSE (%)	3%	3%	3%	2%	3%	3%	2%	2%	3%	3%	3%
Ba_ppm	39.8	39.5	39.9	39.6	39.6	39.8	39.5	39.8	39.7	39.7	39.7
Ba_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%	3%
La_ppm	35.45	36.41	35.6	35.8	35.65	36	35.75	35.83	35.7	35.86	35.72
La_IntSE (%)	3%	3%	3%	2%	2%	3%	3%	2%	3%	3%	3%
Ce_ppm	38.2	39.34	38.8	38.43	38.66	39.1	38.18	38.99	38.61	38.4	39.2
Ce_IntSE (%)	3%	2%	3%	2%	2%	3%	2%	2%	3%	3%	3%
Pr_ppm	36.67	38.07	36.6	37.51	37.03	37.2	36.66	37.89	36.9	37.4	37.13
Pr_IntSE (%)	3%	3%	3%	2%	2%	3%	2%	3%	3%	3%	3%
Nd_ppm	35.6	36.3	35.9	35.8	36.14	35.8	35.5	36.15	35.7	36.1	35.7
Nd_IntSE (%)	3%	3%	3%	3%	2%	3%	3%	3%	3%	3%	3%
Sm_ppm	38.8	39.2	37	38.6	38.1	36.6	37.2	39.3	37.9	38.3	38.9
Sm_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Eu_ppm	34.59	35.9	34.7	34.88	35.26	34.7	34.6	35.32	35	34.75	35
Eu_IntSE (%)	3%	3%	3%	3%	2%	3%	3%	3%	3%	3%	3%
Gd_ppm	36.7	36.8	36.6	36.7	36.9	36.3	36.8	36.7	36.5	37	36.5
Gd_IntSE (%)	3%	3%	4%	3%	3%	3%	3%	3%	3%	4%	3%
Tb_ppm	36	36.5	35.5	36.05	36.28	35.6	35.67	36.4	35.9	36.1	35.9
Tb_IntSE (%)	3%	3%	3%	2%	2%	3%	3%	3%	3%	3%	3%
Dy_ppm	35.5	37.1	36.7	35.84	36.32	34.5	35	37.1	36.5	35.8	36.3
Dy_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Ho_ppm	37.7	39	37.2	38.08	38.47	37.5	37.3	38.4	37.9	38	38.3
Ho_IntSE (%)	3%	3%	3%	2%	3%	3%	3%	3%	3%	3%	3%
Er_ppm	37.8	38.5	38	37.78	38.6	37.4	37.5	38.4	38	38	37.6
Er_IntSE (%)	3%	4%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Tm_ppm	37.6	39	37.3	38.06	38.6	37.1	37.7	38.5	37.9	38.2	37.5
Tm_IntSE (%)	3%	3%	3%	2%	3%	4%	3%	3%	3%	3%	3%
Yb_ppm	38.8	40.2	38.9	39	39.6	39	38.8	39.3	38.9	39.5	38.6
Yb_IntSE (%)	3%	3%	3%	3%	3%	4%	3%	3%	3%	3%	3%
Lu_ppm	36.8	37.9	36.1	36.85	37.6	36.3	36.4	37.3	36.9	37.1	36.3
Lu_IntSE (%)	3%	3%	3%	3%	3%	4%	3%	3%	3%	3%	3%
Hf_ppm	35	35.8	34.36	34.98	36	33.9	34.4	35.6	34.9	35.1	34.6
Hf_IntSE (%)	3%	3%	3%	3%	3%	4%	3%	3%	3%	3%	3%
Ta_ppm	40	40.6	39.6	39.7	40.9	38.9	39.4	40.5	39.8	40.1	39.7
Ta_IntSE (%)	3%	3%	3%	3%	3%	4%	3%	3%	3%	3%	3%

A3.4. Analyses of the international standards (612 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of silicates and ilmenite. Data given in ppm.

	612_166	612_167	612_168	612_169	612_170	612_171	612_172	612_173	612_174	612_175	612_176
Sc_ppm	41.13	40.58	41.3	41.2	41	41.12	40.3	41.3	41.3	40.21	41.48
Sc_IntSE (%)	2%	2%	2%	2%	3%	2%	3%	2%	2%	2%	2%
Ti_ppm	43	42.6	44.4	44.5	43.3	45.3	46.1	45.4	43.8	43.2	44
Ti_IntSE (%)	6%	6%	5%	7%	6%	6%	7%	6%	7%	7%	7%
V_ppm	38.91	38.81	39.37	38.92	38.92	39.46	38.11	39.34	39.3	38.75	39.9
V_IntSE (%)	2%	2%	3%	2%	2%	2%	2%	2%	3%	2%	3%
Cr_ppm	36.99	36.16	36.5	35.54	35.93	37.96	37.83	37.97	36.1	35.23	34.71
Cr_IntSE (%)	3%	2%	3%	2%	2%	2%	3%	2%	3%	3%	2%
Mn_ppm	39.35	37.23	37.69	38.1	37.64	39.03	38.24	39.16	38.09	36.78	37.09
Mn_IntSE (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Co_ppm	35.62	34.93	34.95	34.68	35.17	35.28	35.39	34.58	35.27	34.84	34.79
Co_IntSE (%)	3%	2%	2%	2%	3%	2%	3%	2%	3%	2%	2%
Ni_ppm	38.1	37.8	36.8	39	38.3	38.8	38.8	39.4	40.5	39.4	38.7
Ni_IntSE (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Ga_ppm	36.16	35.54	36.5	35.6	36.14	35.99	35.63	36.51	36.21	35.7	36.02
Ga_IntSE (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Rb_ppm	31.16	31.55	31.14	31.67	31.33	31.41	31.23	31.73	31.34	31.4	31.41
Rb_IntSE (%)	2%	3%	2%	3%	2%	3%	2%	3%	3%	3%	2%
Sr_ppm	78.4	78.1	78.3	79.4	78	78.4	77.8	79.8	78.1	77.6	79.4
Sr_IntSE (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%
Y_ppm	38.01	37.86	38	38.2	37.9	38	37.7	38.4	38	37.9	38.08
Y_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	2%
Zr_ppm	37.9	38	37.8	38.2	38	37.7	38.2	38.2	37.9	37.9	37.92
Zr_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	2%
Nb_ppm	39.9	40.02	39.93	40	40	39.8	40.24	40	40	40	39.8
Nb_IntSE (%)	3%	2%	2%	3%	3%	3%	2%	3%	3%	3%	2%
Cs_ppm	42	42.1	41.6	42.5	41.9	41.9	41.8	42.4	42	41.94	41.8
Cs_IntSE (%)	3%	3%	3%	3%	2%	3%	2%	3%	3%	2%	3%
Ba_ppm	39.8	39.7	39.6	39.8	39.7	39.7	39.7	39.7	39.8	39.6	39.9
Ba_IntSE (%)	4%	3%	3%	4%	3%	4%	4%	4%	3%	3%	4%
La_ppm	35.87	35.83	35.52	36.2	35.66	35.75	35.71	36	35.84	35.49	35.96
La_IntSE (%)	3%	3%	3%	3%	2%	3%	2%	3%	3%	3%	2%
Ce_ppm	38.5	38.7	38.41	39	38.71	38.46	38.65	39.5	38.5	38.4	38.9
Ce_IntSE (%)	3%	3%	3%	3%	3%	2%	2%	3%	3%	3%	3%
Pr_ppm	37.5	37.22	36.71	37.6	37.25	36.6	37.25	38.1	37.4	36.6	36.91
Pr_IntSE (%)	3%	2%	3%	3%	2%	3%	3%	3%	3%	3%	2%
Nd_ppm	36.1	35.5	36.3	35.9	35.87	35.7	36	36.2	35.8	36	35.6
Nd_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Sm_ppm	39.1	37.5	36.8	38.9	38.2	37.7	39.1	39.7	38.6	36.9	36.7
Sm_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	4%	3%	3%	3%
Eu_ppm	35.4	34.74	34.79	35.9	34.78	34.7	35.1	35.2	35.2	34.81	34.85
Eu_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Gd_ppm	36.9	36.2	37	36.8	36.6	36.4	36.9	36.7	37	36.5	36.5
Gd_IntSE (%)	3%	4%	3%	3%	3%	4%	3%	4%	4%	4%	3%
Tb_ppm	36.1	35.9	35.7	36.5	35.9	36	35.8	36.2	36.1	35.9	36
Tb_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Dy_ppm	36.8	35.1	34.7	36.3	36.8	35.1	36.8	37.2	36.6	34.9	35.2
Dy_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	4%	3%	3%
Ho_ppm	37.9	37.7	37.9	38.5	37.8	37.9	38	38.1	38.2	38.2	37.3
Ho_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Er_ppm	38.5	38	37.6	38.5	38	37.8	37.7	38.6	38	38.2	37.3
Er_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Tm_ppm	38.4	38	37.6	38.6	38	38	37.7	38.3	38.1	38	37.6
Tm_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Yb_ppm	40.3	38.8	38.4	39.7	39.7	38.4	39.5	40	39.5	38.7	38.7
Yb_IntSE (%)	3%	4%	3%	4%	3%	3%	4%	4%	4%	4%	4%
Lu_ppm	37.5	36.6	36.6	37.3	37.1	36.6	36.8	37.2	37.3	36.7	36.5
Lu_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%
Hf_ppm	35.7	34.7	34.6	35.3	35.4	34.6	35.1	35.3	35.5	34.3	34.7
Hf_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%
Ta_ppm	40.7	39.2	39.8	40.1	40.5	39.7	39.9	40.2	41	39.6	39.3
Ta_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%

A3.4. Analyses of the international standards (612 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of silicates and ilmenite. Data given in ppm.

	612_177	612_178	612_179	612_180	612_181	612_182	612_183	612_184	612_185	612_186	612_187
Sc_ppm	40.9	41.17	40.8	41.3	40.8	41.4	40.45	41.1	41.2	41.27	40.55
Sc_IntSE (%)	3%	2%	2%	2%	2%	3%	2%	2%	3%	2%	2%
Ti_ppm	45.4	45	42.4	42.2	46.7	42.3	39.7	43	45.9	43.7	44.7
Ti_IntSE (%)	7%	6%	6%	7%	6%	6%	6%	7%	6%	7%	7%
V_ppm	37.97	40	39.01	38.75	39.15	39.29	38.5	38.8	39.47	38.93	38.72
V_IntSE (%)	2%	2%	3%	2%	2%	2%	3%	3%	2%	2%	2%
Cr_ppm	35.87	37.37	35.79	36.88	36.25	35.21	35.12	34.51	36.44	36.7	36.04
Cr_IntSE (%)	3%	3%	2%	3%	2%	3%	3%	2%	2%	2%	3%
Mn_ppm	38.18	38.06	38.37	38.31	38.64	37.88	37.16	36.98	38.31	38.82	37.75
Mn_IntSE (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Co_ppm	34.1	36.03	35.17	35.21	34.41	35.82	34.28	34.71	35.39	35.64	34.66
Co_IntSE (%)	3%	3%	3%	3%	2%	3%	2%	3%	2%	2%	3%
Ni_ppm	38.3	39.4	38.2	38.3	39.5	39.5	37.5	39	38.5	40.4	37
Ni_IntSE (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Ga_ppm	35.78	36.35	36.04	35.59	36.16	36.38	35.78	35.45	36.51	36.16	35.7
Ga_IntSE (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Rb_ppm	31.03	31.74	31.42	31.25	31.38	31.68	31.21	31.14	31.9	31.32	31.09
Rb_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	2%	3%	3%	3%
Sr_ppm	77.9	78.7	78.4	78.2	78.2	79.2	77.5	78.9	78.4	78.6	78.1
Sr_IntSE (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Y_ppm	37.8	38.2	38	37.8	38.02	38.3	37.4	38.5	38	37.93	37.74
Y_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Zr_ppm	38.4	37.84	38	37.9	37.9	38.3	37.7	38.1	38.3	37.9	37.7
Zr_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Nb_ppm	40.3	39.98	40.02	39.7	40.16	40.2	39.62	40.2	40.1	39.96	40
Nb_IntSE (%)	3%	2%	2%	3%	2%	3%	2%	2%	2%	2%	3%
Cs_ppm	41.86	42.4	41.9	42.2	41.6	42.6	41.3	42.3	42.2	42.1	41.5
Cs_IntSE (%)	2%	3%	3%	3%	3%	3%	3%	3%	3%	2%	3%
Ba_ppm	39.7	39.7	39.7	39.6	39.7	39.8	39.4	40.5	39.8	39.6	39.8
Ba_IntSE (%)	3%	3%	3%	3%	3%	4%	3%	4%	4%	3%	4%
La_ppm	35.81	35.82	35.8	35.7	35.78	36.07	35.48	36	35.83	35.87	35.63
La_IntSE (%)	3%	3%	3%	3%	3%	3%	2%	3%	3%	3%	2%
Ce_ppm	38.3	39.4	38.5	38.7	38.78	39.1	37.9	39	39	38.8	38.1
Ce_IntSE (%)	3%	3%	3%	3%	2%	3%	3%	3%	3%	3%	3%
Pr_ppm	37.14	38	36.87	37.4	37.6	37.6	36.1	37.1	37.51	37.6	36.74
Pr_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	2%	3%	2%
Nd_ppm	35.9	36.3	35.9	35.5	36.2	36.1	35.6	35.7	36.2	35.94	35.6
Nd_IntSE (%)	4%	3%	3%	3%	3%	3%	3%	4%	4%	3%	3%
Sm_ppm	37.8	39.1	38.3	38.4	38.7	40.2	35.8	37.6	37.8	38.9	38.4
Sm_IntSE (%)	3%	3%	3%	3%	4%	3%	3%	4%	3%	3%	4%
Eu_ppm	34.6	35.7	34.9	34.6	35.35	35.2	34.6	34.8	35.3	35.14	34.64
Eu_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Gd_ppm	36.5	37.1	36.6	36.4	36.9	37.2	36.3	37	36.8	36.8	36.4
Gd_IntSE (%)	3%	4%	4%	4%	3%	3%	3%	4%	4%	3%	4%
Tb_ppm	35.7	36.4	36	35.7	36.19	36.3	35.5	36	36.5	35.9	35.8
Tb_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Dy_ppm	35.3	37.3	36.3	36.3	36.8	37.1	33.5	34.9	37.1	36.6	35.8
Dy_IntSE (%)	3%	3%	4%	4%	3%	4%	4%	4%	3%	3%	3%
Ho_ppm	37.9	38.7	37.7	38	38.3	38.1	37.6	37.7	38.4	38	37.8
Ho_IntSE (%)	3%	3%	3%	4%	3%	3%	3%	3%	3%	3%	3%
Er_ppm	37.8	38.4	38	37.5	38.4	38.2	37.8	37.4	38.5	38.1	37.7
Er_IntSE (%)	3%	3%	4%	3%	3%	4%	3%	4%	3%	3%	3%
Tm_ppm	37.9	38.4	37.9	37.9	38.4	38.1	37.7	37.5	38.5	38	37.8
Tm_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Yb_ppm	38	41.4	38.7	39.5	39.7	39.8	37.9	38.9	40.2	39.3	38.9
Yb_IntSE (%)	3%	4%	4%	4%	4%	4%	3%	3%	3%	3%	3%
Lu_ppm	36.1	38.1	36.7	36.9	36.9	37.6	36.2	36.2	37.8	37.1	36.5
Lu_IntSE (%)	3%	3%	4%	4%	3%	4%	3%	4%	3%	3%	3%
Hf_ppm	34.9	36	34.7	35.2	35.2	35.5	34.2	34.5	35.9	35.1	34.6
Hf_IntSE (%)	3%	4%	4%	4%	3%	4%	3%	4%	3%	3%	3%
Ta_ppm	39.4	41.2	39.6	40.7	40.2	40.1	39.3	38.9	40.9	40.4	40
Ta_IntSE (%)	4%	3%	3%	4%	3%	4%	3%	4%	3%	3%	3%

A3.4. Analyses of the international standards (612 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of silicates and ilmenite. Data given in ppm.

	612_188	612_189	612_190	612_191	612_192	612_193	612_194	612_195	612_196	612_197	612_198
Sc_ppm	41.3	41.63	40.4	40.67	42.2	40.4	40.8	41.55	40.22	41.46	40.8
Sc_IntSE (%)	2%	2%	3%	2%	3%	3%	3%	2%	2%	2%	3%
Ti_ppm	44.3	42.4	45.9	46.1	44.6	43.7	45.9	46.4	42.8	44.2	44.1
Ti_IntSE (%)	6%	8%	8%	8%	6%	5%	6%	6%	7%	7%	8%
V_ppm	39.4	39.6	38.4	38.88	39.5	38.78	39	39.11	38.8	39.2	39.3
V_IntSE (%)	3%	3%	3%	2%	3%	2%	3%	2%	3%	3%	3%
Cr_ppm	36.6	36.5	35.86	36.3	36.2	36	35.87	36.32	35.74	37.58	35.9
Cr_IntSE (%)	3%	3%	2%	3%	2%	3%	3%	2%	3%	3%	4%
Mn_ppm	38.2	38.37	37.67	37.68	38.14	38.18	37.89	37.35	38.47	39.11	38.16
Mn_IntSE (%)	3%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Co_ppm	35.6	35.49	34.18	35.5	35.39	34.7	34.76	34.64	34.92	35.71	35.1
Co_IntSE (%)	3%	3%	2%	3%	3%	3%	2%	2%	2%	3%	3%
Ni_ppm	39.4	38.1	38.8	39.1	40	39.6	38	38.7	39.2	37.4	39
Ni_IntSE (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	5%	4%
Ga_ppm	36.36	36.37	35.64	36.04	36.22	35.79	35.67	36.26	36.25	35.83	36.2
Ga_IntSE (%)	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%
Rb_ppm	31.76	31.66	31.15	31.29	31.73	31.22	31.41	31.35	31.42	31.43	31.51
Rb_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	2%	2%	3%	3%
Sr_ppm	79.2	77.7	78.8	78.1	78.4	78.7	77.9	78.6	78.7	78.3	78.6
Sr_IntSE (%)	3%	3%	2%	3%	2%	2%	3%	2%	2%	2%	3%
Y_ppm	38.7	37.34	38.5	37.8	38	38.2	37.8	38.1	37.9	38.1	37.8
Y_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	2%	3%	3%
Zr_ppm	38.4	37.8	38.1	37.8	38.2	38.1	37.8	38.2	38	38	38
Zr_IntSE (%)	3%	3%	3%	3%	3%	4%	3%	3%	3%	3%	4%
Nb_ppm	40	40	40.1	39.9	39.97	40.2	39.9	39.95	40.12	40	40
Nb_IntSE (%)	3%	3%	2%	3%	2%	3%	3%	2%	2%	3%	3%
Cs_ppm	42.9	41.8	42	42.1	42	42	42	41.9	42.2	42	42.2
Cs_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Ba_ppm	39.5	39.9	39.6	39.7	39.9	39.7	39.6	39.8	39.6	39.7	39.8
Ba_IntSE (%)	4%	4%	3%	3%	3%	4%	4%	3%	4%	3%	5%
La_ppm	36.04	35.71	35.87	35.5	36.08	35.78	35.8	35.59	36.4	35.59	35.7
La_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%
Ce_ppm	39.5	38.7	38.6	38.5	38.8	38.9	38.4	38.73	38.9	38.6	39
Ce_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	2%	3%	3%	3%
Pr_ppm	38	37.1	37.2	37.11	36.99	37.6	36.8	37.23	37.5	37.3	37.4
Pr_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Nd_ppm	36.6	35.6	36	35.9	35.9	35.9	35.5	36.2	35.7	36	35.9
Nd_IntSE (%)	4%	3%	3%	3%	3%	3%	4%	3%	3%	3%	4%
Sm_ppm	38.9	37.6	38.4	37.2	38.6	37.7	37.5	38.4	39.1	39.2	37.5
Sm_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	4%	4%	4%
Eu_ppm	35.6	34.6	35.3	34.55	35.7	34.9	34.8	35	35.3	34.8	35.1
Eu_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%
Gd_ppm	37.7	35.6	37.4	36.5	36.5	37.1	36.7	36.5	36.9	36.7	36.5
Gd_IntSE (%)	4%	3%	3%	4%	3%	4%	4%	3%	3%	4%	5%
Tb_ppm	36.6	35.4	36.4	35.6	36.3	36.1	35.6	36.2	36.1	36	36.2
Tb_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%
Dy_ppm	37	35.7	36.5	34.5	36.2	36.7	35.1	36	36.8	36.8	35.5
Dy_IntSE (%)	4%	4%	3%	3%	4%	4%	3%	3%	3%	4%	4%
Ho_ppm	38.6	37.5	38.4	37.4	38.4	38	37.7	38	38.1	38	37.8
Ho_IntSE (%)	4%	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%
Er_ppm	38.8	37.1	38.6	37.5	38.2	38.4	38.1	37.6	38	38.3	38
Er_IntSE (%)	4%	4%	3%	3%	3%	4%	4%	3%	3%	4%	4%
Tm_ppm	38.6	37.5	38.3	37.6	38.2	38.2	37.9	37.9	37.9	38.3	38.1
Tm_IntSE (%)	4%	3%	3%	3%	3%	3%	4%	3%	3%	4%	4%
Yb_ppm	40.3	38.5	39.9	38.5	39.3	39.9	38.8	39.5	38.8	39.6	39.2
Yb_IntSE (%)	4%	3%	4%	3%	4%	4%	4%	3%	4%	4%	4%
Lu_ppm	37.4	36.2	37.5	36.1	37.5	37.1	36.3	37.3	36.7	37.2	36.9
Lu_IntSE (%)	3%	4%	3%	3%	3%	4%	4%	3%	3%	3%	4%
Hf_ppm	36	34.1	35.7	34.6	35.2	35.4	34.3	35.3	35	35.3	35
Hf_IntSE (%)	4%	4%	3%	3%	3%	4%	3%	3%	3%	4%	4%
Ta_ppm	40	39.7	40.5	38.9	40.9	40.6	39.3	40	40.1	40.6	39.6
Ta_IntSE (%)	4%	4%	3%	3%	3%	4%	4%	3%	3%	4%	4%

A3.4. Analyses of the international standards (612 NIST glass) used for calibration of the LA-ICP-MS to obtain the trace element content of silicates and ilmenite. Data given in ppm.

	612_199	612_200	612_201	612_202	612_203	612_204	612_205	612_206
Sc_ppm	40.9	41.2	40.7	41.3	41.1	40.4	41.9	40.8
Sc_IntSE (%)	3%	3%	3%	3%	2%	2%	3%	2%
Ti_ppm	46	43.3	43.1	41.3	42.8	44.8	44.8	43.8
Ti_IntSE (%)	7%	8%	7%	8%	6%	6%	7%	7%
V_ppm	38.29	39.8	39	39.1	38.62	39.5	39	39
V_IntSE (%)	2%	3%	3%	3%	2%	3%	3%	3%
Cr_ppm	35.89	36.5	35.75	35.4	36.48	36.61	36.41	35.3
Cr_IntSE (%)	3%	3%	3%	3%	3%	3%	2%	3%
Mn_ppm	37.45	37.5	37.92	38.5	38.67	37.51	38.41	37.17
Mn_IntSE (%)	2%	3%	2%	3%	2%	2%	2%	2%
Co_ppm	34.83	35	35.53	34.62	34.85	35.08	34.95	35.19
Co_IntSE (%)	3%	3%	3%	3%	3%	3%	2%	3%
Ni_ppm	38.6	40.3	37.9	38.3	39.2	38.8	38.7	37.2
Ni_IntSE (%)	4%	5%	4%	4%	4%	4%	5%	5%
Ga_ppm	35.45	36.43	36.31	35.54	36.4	35.64	36.03	36.03
Ga_IntSE (%)	2%	2%	2%	2%	2%	2%	2%	2%
Rb_ppm	31.21	31.55	31.55	31.24	31.44	31.05	31.77	31.15
Rb_IntSE (%)	3%	3%	3%	3%	2%	3%	2%	3%
Sr_ppm	77.9	78.9	78.4	78.4	78.5	77.7	79.1	78
Sr_IntSE (%)	2%	3%	2%	2%	2%	2%	2%	2%
Y_ppm	38.2	38	37.85	38.2	38.11	37.65	38.23	38
Y_IntSE (%)	3%	4%	3%	3%	3%	3%	2%	3%
Zr_ppm	38	38	38	38	38.1	37.8	38.27	37.9
Zr_IntSE (%)	3%	4%	3%	3%	3%	3%	3%	3%
Nb_ppm	40.1	40	40	40	40.18	39.4	40.48	39.89
Nb_IntSE (%)	3%	3%	3%	3%	2%	3%	2%	2%
Cs_ppm	41.4	42.4	41.9	42	41.89	41.9	42.5	41.6
Cs_IntSE (%)	3%	3%	3%	3%	2%	2%	2%	3%
Ba_ppm	39.6	39.8	39.7	39.5	39.8	39.4	40.5	39.3
Ba_IntSE (%)	3%	4%	3%	4%	3%	3%	3%	3%
La_ppm	35.9	35.8	35.73	35.9	35.79	35.46	36.34	35.5
La_IntSE (%)	3%	3%	3%	3%	2%	3%	2%	3%
Ce_ppm	38.1	39.2	38.64	38.8	38.61	38.64	39.1	38.5
Ce_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%
Pr_ppm	36.43	38.2	37.3	37.1	36.88	36.76	38.65	36.5
Pr_IntSE (%)	3%	3%	3%	3%	2%	3%	2%	3%
Nd_ppm	35.8	36	35.6	36	35.8	35.7	36.5	35.7
Nd_IntSE (%)	3%	4%	3%	3%	3%	3%	3%	3%
Sm_ppm	37.1	38.4	38.1	38.8	37.5	38.1	39.5	37.3
Sm_IntSE (%)	4%	4%	3%	3%	3%	3%	3%	3%
Eu_ppm	34.74	35.3	35	35.1	34.87	34.8	35.8	34.62
Eu_IntSE (%)	3%	3%	3%	3%	3%	3%	3%	3%
Gd_ppm	36.6	36.9	36.3	37	36.5	36.6	37.3	36.3
Gd_IntSE (%)	3%	4%	4%	3%	3%	4%	3%	4%
Tb_ppm	35.7	36.3	36	36	35.9	35.9	36.4	35.8
Tb_IntSE (%)	3%	4%	3%	3%	3%	3%	3%	3%
Dy_ppm	35.3	36.6	36.5	36	35.6	35.8	37.1	35.5
Dy_IntSE (%)	3%	4%	3%	3%	3%	3%	3%	3%
Ho_ppm	38.2	38	37.7	38.3	38	37.8	38.4	37.9
Ho_IntSE (%)	3%	4%	3%	3%	3%	3%	3%	3%
Er_ppm	38	38.1	37.8	38.2	37.8	37.8	39	37.6
Er_IntSE (%)	3%	4%	3%	3%	3%	3%	3%	3%
Tm_ppm	37.7	38.5	37.8	38.2	38.1	37.6	38.6	37.8
Tm_IntSE (%)	3%	4%	3%	3%	3%	3%	3%	3%
Yb_ppm	39.1	39.3	38.8	39.5	38.9	39.2	39.9	38.8
Yb_IntSE (%)	3%	5%	4%	3%	3%	3%	3%	4%
Lu_ppm	37	36.7	36.8	37.1	36.9	36.7	37.3	36.8
Lu_IntSE (%)	3%	4%	4%	4%	3%	3%	3%	3%
Hf_ppm	35	35	34.8	35.3	34.8	35	35.5	34.8
Hf_IntSE (%)	3%	5%	3%	3%	3%	3%	3%	3%
Ta_ppm	40	40.3	39.4	40.7	40.1	39.6	40.4	39.9
Ta_IntSE (%)	3%	4%	3%	3%	3%	3%	3%	3%

A3.4. Average values of the analyses of the NIST 612 international standard, compared to the values of Jochum et al. (2011). Data in ppm

	612 (Jochum et al., 2011)	Mean (n=206)	2SE	Recovery
Sc_ppm	39.9	41.04	0.20%	102.9%
Ti_ppm	44	44.13	0.56%	100.3%
V_ppm	38.8	39.03	0.27%	100.6%
Cr_ppm	36.4	36.35	1.48%	99.9%
Mn_ppm	38.7	38.11	0.69%	98.5%
Co_ppm	35.5	35.05	0.31%	98.7%
Ni_ppm	38.8	38.85	0.50%	100.1%
Ga_ppm	36.9	36.04	0.28%	97.7%
Rb_ppm	31.4	31.43	0.27%	100.1%
Sr_ppm	78.4	78.47	0.24%	100.1%
Y_ppm	38.3	38.02	0.19%	99.3%
Zr_ppm	37.9	38.03	0.19%	100.3%
Nb_ppm	38.9	40.02	0.22%	102.9%
Cs_ppm	42.7	42.06	0.31%	98.5%
Ba_ppm	39.3	39.74	0.31%	101.1%
La_ppm	36	35.83	0.25%	99.5%
Ce_ppm	38.4	38.72	0.23%	100.8%
Pr_ppm	37.9	37.25	0.27%	98.3%
Nd_ppm	35.5	35.94	0.26%	101.2%
Sm_ppm	37.7	38.15	0.31%	101.2%
Eu_ppm	35.6	35.04	0.26%	98.4%
Gd_ppm	37.3	36.76	0.30%	98.6%
Tb_ppm	37.6	36.04	0.28%	95.8%
Dy_ppm	35.5	36.05	0.34%	101.6%
Ho_ppm	38.3	38.03	0.28%	99.3%
Er_ppm	38	38.05	0.31%	100.1%
Tm_ppm	36.8	38.04	0.28%	103.4%
Yb_ppm	39.2	39.25	0.32%	100.1%
Lu_ppm	37	36.94	0.28%	99.8%
Hf_ppm	36.7	35.06	0.30%	95.5%
Ta_ppm	37.6	40.04	0.27%	106.5%

A3.4. Average measured values of the NIST 610 standard used in the analysis of ilmenite by LA-ICP-MS, compared to the certified values. The reproducibility of the ilmenite analyses on the Angolan nodule are also included.

NIST 610 values (minimum detection limit: MDL)

	MDL (average) ppm	NIST 610 (certified values; ppm)	Measured NIST610 (ppm)	ERROR (2SD)	Number of analysis (N)
Sc	1.250	441	441.0	1.8%	101
V	5.131	442	442.2	2.4%	101
Cr	3.718	405	405.5	3.2%	101
Mn	6.062	433.3	485.1	1.9%	101
Co	0.629	405	405.2	2.3%	101
Ni	3.900	458.7	459.2	2.5%	101
Zn	2.265	456	456.0	3.5%	101
Ga	0.346	438	438.2	2.1%	101
Y	0.076	450	450.2	1.9%	36
Zr	0.557	440	440.0	2.4%	101
Nb	0.990	419	419.0	1.6%	101
La	0.030	457	457.5	2.6%	36
Ce	0.011	448	448.5	2.9%	36
Pr	0.012	430	430.5	2.5%	36
Nd	0.026	431	431.4	2.8%	36
Sm	0.014	451	451.3	2.5%	36
Eu	0.002	461	461.3	2.6%	36
Gd	0.016	444	444.3	2.6%	36
Tb	0.001	443	443.3	2.6%	36
Dy	0.006	427	427.6	2.8%	36
Ho	0.001	449	449.4	2.9%	36
Er	0.002	426	426.3	2.5%	36
Tm	0.001	420	420.2	2.7%	36
Yb	0.009	445	445.2	2.5%	36
Lu	0.002	435	435.4	3.1%	36
Hf	0.030	432	432.2	2.6%	101
Ta	0.135	452	452.2	2.5%	101
W	0.019	445	445.4	3.1%	101
Pb	0.153	426	426.6	3.7%	36
Th	0.003	457.2	457.8	3.1%	36
U	0.012	461.5	462.1	3.3%	101

Reproducibility in ilmenite analysis

	ANG_02 (ppm)	2 SD	N
Sc	19.7	2%	11
V	1559	7%	11
Cr	340.6	30%	11
Mn	2079	7%	11
Co	176	7%	11
Ni	225	6%	11
Zn	299	12%	11
Ga	20.9	9%	11
Zr	651	6%	11
Nb	616	4%	11
Hf	22.2	9%	11
Ta	78.4	8%	11
W	0.10	40%	11
U	0.04	73%	11

A3.4. Analyses of the BCR run as unknown to check the accuracy of the measurements. Data given in ppm.

	BCR_01	BCR_02	BCR_03	BCR_04	BCR_05	BCR_06	BCR_07	BCR_08	BCR_09
^{23}Na	25160	25830	25300	25900	25080	25130	22410	24440	25450
1 σ	*820*	*860*	*1100*	*1100*	*830*	*840*	*760*	*790*	*900*
^{25}Mg	20900	20910	20380	20380	20240	20710	21480	20740	20960
1 σ	*680*	*730*	*930*	*940*	*680*	*700*	*800*	*700*	*750*
^{39}K	18360	18780	19170	19500	18600	17750	17570	17710	19090
1 σ	*650*	*780*	*990*	*1000*	*730*	*600*	*610*	*590*	*660*
^{42}Ca	49800	49800	51200	50000	50400	50300	51900	50200	51100
1 σ	*1600*	*1600*	*1800*	*1700*	*1600*	*1600*	*1800*	*1600*	*1700*
^{43}Ca	51000	51000	51000	51000	51000	51000	51000	51000	51000
1 σ	*1700*	*1700*	*1700*	*1700*	*1700*	*1700*	*1700*	*1700*	*1700*
^{45}Sc	32.9	33.4	33.0	32.7	32.6	33.5	32.9	33.0	33.3
1 σ	*1.1*	*1.1*	*1.1*	*1.1*	*1.1*	*1.1*	*1.2*	*1.1*	*1.2*
^{51}V	430	432	441	437	430	429	421	426	435
1 σ	*14*	*14*	*17*	*16*	*14*	*14*	*14*	*14*	*15*
^{57}Fe	87300	91200	87800	88300	87200	80500	84200	89400	91000
1 σ	*3700*	*3200*	*6200*	*6300*	*3500*	*2800*	*3700*	*4000*	*3600*
^{85}Rb	53.6	54.6	53.5	56.2	53.9	53.2	48.2	52.4	54.2
1 σ	*1.8*	*1.9*	*2.5*	*2.6*	*1.8*	*1.7*	*1.7*	*1.7*	*2.0*
^{86}Sr	343	342	348	343	381	336	324	334	347
1 σ	*11*	*11*	*44*	*44*	*49*	*11*	*12*	*11*	*13*
^{88}Sr	345	342	347	342	347	341	332	344	347
1 σ	*11*	*11*	*11*	*11*	*11*	*11*	*12*	*11*	*11*
^{89}Y	34.3	34.5	34.2	34.2	34.0	34.4	32.1	34.9	35.9
1 σ	*1.1*	*1.1*	*1.2*	*1.2*	*1.1*	*1.1*	*1.2*	*1.2*	*1.2*
^{90}Zr	192.8	190.0	186	188	188.2	189.1	171.0	192.7	194.8
1 σ	*6.2*	*6.1*	*13*	*14*	*6.0*	*6.0*	*5.7*	*6.2*	*6.4*
^{93}Nb	13.37	13.06	13.15	13.20	13.05	13.21	10.16	13.20	13.23
1 σ	*0.46*	*0.45*	*0.50*	*0.51*	*0.44*	*0.44*	*0.40*	*0.45*	*0.47*
^{137}Ba	672	671	679	672	688	685	645	678	678
1 σ	*21*	*23*	*24*	*23*	*23*	*22*	*23*	*22*	*22*
^{139}La	24.91	24.99	24.14	24.51	24.84	24.61	25.05	25.00	25.01
1 σ	*0.80*	*0.81*	*0.83*	*0.85*	*0.80*	*0.80*	*0.92*	*0.81*	*0.85*
^{140}Ce	51.3	51.2	51.8	51.5	51.9	51.4	51.0	51.2	52.2
1 σ	*1.6*	*1.6*	*1.7*	*1.7*	*1.6*	*1.6*	*1.7*	*1.6*	*1.8*
^{141}Pr	6.96	6.99	6.96	6.63	6.94	6.94	6.30	6.65	6.85
1 σ	*0.23*	*0.24*	*0.32*	*0.31*	*0.24*	*0.23*	*0.25*	*0.23*	*0.25*
^{146}Nd	29.5	29.8	28.1	28.2	28.7	30.9	26.5	29.6	29.6
1 σ	*1.0*	*1.1*	*1.3*	*1.3*	*1.0*	*1.1*	*1.2*	*1.1*	*1.1*
^{147}Sm	6.92	6.55	6.49	6.95	6.57	6.76	6.64	6.32	7.16
1 σ	*0.30*	*0.31*	*0.40*	*0.43*	*0.31*	*0.30*	*0.45*	*0.31*	*0.35*
^{153}Eu	1.922	1.837	1.79	1.87	1.937	1.948	2.01	1.842	2.077
1 σ	*0.082*	*0.085*	*0.11*	*0.12*	*0.088*	*0.084*	*0.13*	*0.087*	*0.099*
^{157}Gd	6.52	6.82	6.32	6.36	7.05	6.92	6.10	6.75	6.16
1 σ	*0.28*	*0.31*	*0.39*	*0.40*	*0.32*	*0.29*	*0.40*	*0.31*	*0.30*
^{159}Tb	0.957	0.996	0.883	0.907	0.983	0.969	0.948	0.989	0.989
1 σ	*0.041*	*0.045*	*0.058*	*0.061*	*0.045*	*0.042*	*0.063*	*0.046*	*0.048*
^{161}Dy	6.27	6.43	6.24	6.25	6.27	6.63	5.28	6.69	6.28
1 σ	*0.26*	*0.28*	*0.39*	*0.40*	*0.28*	*0.27*	*0.35*	*0.30*	*0.30*
^{165}Ho	1.307	1.313	1.354	1.333	1.337	1.391	1.198	1.329	1.403
1 σ	*0.054*	*0.057*	*0.091*	*0.091*	*0.058*	*0.056*	*0.073*	*0.058*	*0.063*
^{167}Er	3.61	3.51	3.44	3.40	3.47	3.82	3.15	3.73	3.85
1 σ	*0.16*	*0.17*	*0.26*	*0.26*	*0.17*	*0.17*	*0.23*	*0.18*	*0.19*
^{169}Tm	0.546	0.483	0.512	0.481	0.463	0.547	0.509	0.483	0.533
1 σ	*0.028*	*0.027*	*0.040*	*0.038*	*0.026*	*0.027*	*0.042*	*0.029*	*0.031*
^{173}Yb	3.49	3.66	3.27	3.18	3.31	3.48	3.39	3.68	3.81
1 σ	*0.18*	*0.19*	*0.28*	*0.28*	*0.18*	*0.17*	*0.28*	*0.20*	*0.21*
^{175}Lu	0.494	0.552	0.485	0.529	0.544	0.490	0.559	0.478	0.523
1 σ	*0.026*	*0.030*	*0.041*	*0.045*	*0.030*	*0.026*	*0.046*	*0.029*	*0.032*
^{178}Hf	5.79	4.86	4.91	4.79	5.13	4.96	4.29	4.85	4.96
1 σ	*0.23*	*0.20*	*0.34*	*0.34*	*0.22*	*0.20*	*0.26*	*0.21*	*0.22*
^{181}Ta	0.763	0.765	0.707	0.730	0.710	0.751	0.607	0.742	0.783
1 σ	*0.037*	*0.038*	*0.062*	*0.065*	*0.037*	*0.035*	*0.045*	*0.039*	*0.041*
^{232}Th	6.10	6.18	6.23	6.04	5.93	6.23	5.80	6.10	6.42
1 σ	*0.21*	*0.22*	*0.49*	*0.48*	*0.24*	*0.21*	*0.25*	*0.22*	*0.24*
^{238}U	1.732	1.868	1.86	1.83	1.694	1.682	1.585	1.808	1.809
1 σ	*0.072*	*0.079*	*0.15*	*0.15*	*0.081*	*0.068*	*0.095*	*0.077*	*0.080*

A3.4. Analyses of the home-made PGEA standard used for calibration of the LA-ICP-MS to obtain the trace element content of chromite. Data given in ppm.

	PGEA-01	PGEA-02	PGEA-03	PGEA-04	PGEA-05	PGEA-06	PGEA-07	PGEA-08	PGEA-09	PGEA-10	PGEA-11	PGEA-12
^{34}S	278000	278000	278000	278000	278000	278000	278000	278000	278000	278000	278000	278000
1σ	*8800*	*8800*	*8800*	*8800*	*8800*	*8800*	*8800*	*8800*	*8800*	*8800*	*8800*	*8800*
^{57}Fe	149.4	151	147	162	163	141	151.7	148.7	166	133	146	156
1σ	*8.2*	*12*	*21*	*26*	*33*	*29*	*9.7*	*9.1*	*21*	*18*	*30*	*33*
^{60}Ni	736000	688000	713000	715000	756000	688000	702000	726000	695000	742000	721000	707000
1σ	*36000*	*33000*	*57000*	*58000*	*87000*	*82000*	*52000*	*56000*	*32000*	*35000*	*47000*	*48000*
^{62}Ni	716000	715000	724000	682000	734000	702000	690000	736000	689000	753000	710000	720000
1σ	*31000*	*31000*	*41000*	*39000*	*58000*	*57000*	*42000*	*47000*	*38000*	*42000*	*57000*	*60000*
^{65}Cu	284	202	252	221	233	254	248	244	283	209	246	244
1σ	*50*	*36*	*27*	*23*	*34*	*37*	*76*	*78*	*45*	*33*	*61*	*63*
^{75}As	133.1	128.3	135	118	135	128	127.0	134.2	128.2	134.8	129.9	132.3
1σ	*5.9*	*5.8*	*12*	*11*	*18*	*17*	*8.3*	*9.1*	*5.4*	*5.7*	*7.2*	*7.5*
^{82}Se	234	214	229	220	232	223	231	225	219	237	226	228
1σ	*13*	*12*	*12*	*13*	*15*	*15*	*20*	*20*	*12*	*13*	*17*	*18*
^{99}Ru	213	190	205	194	211	197	190	214	206.8	198.8	201	206
1σ	*19*	*17*	*14*	*14*	*20*	*19*	*27*	*32*	*8.3*	*8.0*	*10*	*11*
^{101}Ru	217	186	207	189	209	199	191	214	212	193	198	210
1σ	*22*	*19*	*15*	*14*	*19*	*18*	*32*	*37*	*14*	*13*	*20*	*22*
^{103}Rh	247	191	222	213	227	215	206	233	239	201	216	226
1σ	*36*	*28*	*13*	*12*	*17*	*16*	*50*	*59*	*23*	*19*	*33*	*36*
^{107}Ag	232.4	224.5	235	211	230	228	223	233	237	220	230	228
1σ	*9.3*	*9.1*	*15*	*14*	*21*	*21*	*13*	*14*	*11*	*11*	*16*	*16*
^{108}Pd	313	228	278	249	275	268	254	288	321	229	268	278
1σ	*55*	*40*	*20*	*18*	*25*	*25*	*75*	*88*	*57*	*41*	*76*	*82*
^{111}Cd	31.4	30.6	29.9	36.0	30.5	31.3	29.9	31.9	32.5	29.3	31.5	30.5
1σ	*1.5*	*1.5*	*3.2*	*4.0*	*5.7*	*6.1*	*2.1*	*2.4*	*2.1*	*1.9*	*3.0*	*3.0*
^{125}Te	219	207	222	188	225	207	207	220	209.0	220.2	216	211
1σ	*11*	*10*	*26*	*22*	*39*	*37*	*16*	*18*	*8.9*	*9.4*	*13*	*13*
^{185}Re	0.0036	<0.082	0.0033	<*****	0.004	0.003	0.0025	0.0038	0.0011	0.0039	0.007	<****
1σ	*0.0065*	*0.055*	*0.0036*	*0.023*	*0.038*	*0.035*	*0.0028*	*0.0039*	*0.0026*	*0.0046*	*0.043*	*0.17*
^{189}Os	190.4	200.5	213	149	190	199	191.7	195.9	154	284	200	180
1σ	*8.2*	*8.7*	*41*	*30*	*75*	*84*	*9.7*	*10.0*	*50*	*92*	*110*	*100*
^{193}Ir	208	210	216	186	206	211	199	216	181	258	212	203
1σ	*11*	*11*	*19*	*17*	*29*	*31*	*15*	*17*	*34*	*48*	*62*	*62*
^{195}Pt	211	196.2	203	209	221	193	202	207	200	211	199	213
1σ	*10*	*9.6*	*23*	*24*	*38*	*34*	*14*	*14*	*11*	*12*	*17*	*19*
^{197}Au	215.2	207.6	217	197	214	211	210.3	214	214.8	208.3	216	207
1σ	*7.7*	*7.5*	*14*	*12*	*19*	*19*	*9.6*	*10*	*8.9*	*8.6*	*12*	*12*
^{208}Pb	30.9	26.6	30.9	24.1	27.9	30.1	30.9	27.9	30.8	27.0	29.7	28.3
1σ	*3.0*	*2.6*	*4.7*	*3.7*	*6.3*	*7.0*	*5.0*	*4.7*	*2.4*	*2.1*	*3.6*	*3.5*
^{209}Bi	221	198	224	177	205	217	213	211	209.8	212.3	214.0	207.3
1σ	*14*	*13*	*31*	*25*	*43*	*46*	*22*	*22*	*7.5*	*7.6*	*9.3*	*9.2*

Zircon GJ

	RATIOS							
Analysis No.	$^{207}Pb/^{206}Pb$	+/-2s	$^{207}Pb/^{235}U$	+/-2s	$^{206}Pb/^{238}U$	+/-2s	$^{208}Pb/^{232}Th$	+/-2s
STDGJ_01	0.06011	0.00178	0.80842	0.02446	0.09755	0.00229	0.03073	0.00150
STDGJ_02	0.05923	0.00163	0.82163	0.02300	0.10061	0.00226	0.03201	0.00141
STDGJ_03	0.06004	0.00194	0.81665	0.02654	0.09866	0.00232	0.03086	0.00169
STDGJ_04	0.06012	0.00231	0.80502	0.03053	0.09712	0.00238	0.03125	0.00218
STDGJ_05	0.06009	0.00152	0.81485	0.02140	0.09835	0.00222	0.03011	0.00110
STDGJ_06	0.06067	0.00153	0.79848	0.02090	0.09547	0.00216	0.02970	0.00108
STDGJ_07	0.06033	0.00152	0.80164	0.02077	0.09638	0.00214	0.03171	0.00115
STDGJ_08	0.05986	0.00152	0.80873	0.02108	0.09799	0.00218	0.03055	0.00113
STDGJ_09	0.06056	0.00154	0.81967	0.02181	0.09817	0.00223	0.02980	0.00113
STDGJ_10	0.06042	0.00157	0.81042	0.02272	0.09729	0.00234	0.03050	0.00119
STDGJ_11	0.05975	0.00150	0.80321	0.02112	0.09750	0.00221	0.03069	0.00112
STDGJ_12	0.06005	0.00154	0.79431	0.02144	0.09594	0.00221	0.03255	0.00122
STDGJ_13	0.05996	0.00151	0.82264	0.02165	0.09952	0.00225	0.03115	0.00116
STDGJ_14	0.05980	0.00150	0.80495	0.02115	0.09764	0.00221	0.03033	0.00113
STDGJ_15	0.06003	0.00154	0.83031	0.02230	0.10033	0.00230	0.03064	0.00117
STDGJ_16	0.05985	0.00153	0.81113	0.02172	0.09830	0.00225	0.02907	0.00110
STDGJ_17	0.06021	0.00158	0.78108	0.02138	0.09410	0.00216	0.03087	0.00120
STDGJ_18	0.06052	0.00157	0.81433	0.02215	0.09760	0.00224	0.03295	0.00126
STDGJ_19	0.06070	0.00165	0.79045	0.02248	0.09447	0.00221	0.02994	0.00124
STDGJ_20	0.06016	0.00156	0.82103	0.02241	0.09902	0.00230	0.03180	0.00121
STDGJ_21	0.05961	0.00152	0.81634	0.02209	0.09935	0.00230	0.02998	0.00114
STDGJ_22	0.06026	0.00153	0.80595	0.02168	0.09702	0.00225	0.03116	0.00115
STDGJ_23	0.05964	0.00158	0.84216	0.02390	0.10251	0.00246	0.03093	0.00125
STDGJ_24	0.06061	0.00193	0.73171	0.02416	0.08763	0.00217	0.03096	0.00160
STDGJ_25	0.06063	0.00196	0.83306	0.02787	0.09975	0.00248	0.03010	0.00167
STDGJ_26	0.06069	0.00216	0.80577	0.02925	0.09638	0.00245	0.03063	0.00189
STDGJ_27	0.06161	0.00069	0.83031	0.00885	0.09776	0.00061	0.03162	0.00070
STDGJ_28	0.06059	0.00060	0.81819	0.00781	0.09795	0.00059	0.03023	0.00059
STDGJ_29	0.06021	0.00064	0.80110	0.00811	0.09650	0.00059	0.03019	0.00063
STDGJ_30	0.06203	0.00062	0.76953	0.00740	0.08997	0.00054	0.02928	0.00057
STDGJ_31	0.05987	0.00063	0.79741	0.00801	0.09661	0.00059	0.03070	0.00062
STDGJ_32	0.06146	0.00064	0.82642	0.00826	0.09752	0.00060	0.03092	0.00063
STDGJ_33	0.05990	0.00081	0.80665	0.01034	0.09768	0.00066	0.03043	0.00081
STDGJ_34	0.06041	0.00083	0.81256	0.01060	0.09757	0.00067	0.03098	0.00084
STDGJ_35	0.06052	0.00064	0.81478	0.00828	0.09766	0.00060	0.03151	0.00065
STDGJ_36	0.05971	0.00063	0.80351	0.00813	0.09761	0.00060	0.03002	0.00062
STDGJ_37	0.05927	0.00067	0.80640	0.00873	0.09868	0.00062	0.03119	0.00070
STDGJ_38	0.06014	0.00067	0.80974	0.00870	0.09766	0.00061	0.03085	0.00069
STDGJ_39	0.06023	0.00084	0.80693	0.01063	0.09718	0.00066	0.02968	0.00083
STDGJ_40	0.06026	0.00085	0.80718	0.01084	0.09716	0.00067	0.03097	0.00087
STDGJ_41	0.05993	0.00087	0.81317	0.01121	0.09842	0.00069	0.03153	0.00091

Zircon GJ

	AGES (Ma)								NORMAL CONCORDIA PLOT DATA				INVERSE CONCORDIA PLOT DATA			
Analysis No.	$^{207}Pb/^{206}Pb$	+/-2s	$^{207}Pb/^{235}U$	+/-2s	$^{206}Pb/^{238}U$	+/-2s	$^{208}Pb/^{232}Th$	+/-2s	$^{207}Pb/^{235}U$	1s	$^{206}Pb/^{238}U$	1s	$^{238}U/^{206}Pb$	RSD	$^{207}Pb/^{206}Pb$	RSD
STDGJ_01	608	63	602	14	600	13	612	29	0.80842	0.01223	0.09755	0.00114	10.251	1.172	0.0601	1.4784
STDGJ_02	576	59	609	13	618	13	637	28	0.82163	0.01150	0.10061	0.00113	9.939	1.125	0.0592	1.3778
STDGJ_03	605	69	606	15	607	14	614	33	0.81665	0.01327	0.09866	0.00116	10.136	1.178	0.0600	1.6168
STDGJ_04	608	82	600	17	598	14	622	43	0.80502	0.01526	0.09712	0.00119	10.297	1.227	0.0601	1.9231
STDGJ_05	607	54	605	12	605	13	600	22	0.81485	0.01070	0.09835	0.00111	10.168	1.127	0.0601	1.2657
STDGJ_06	627	54	596	12	588	13	592	21	0.79848	0.01045	0.09547	0.00108	10.475	1.129	0.0607	1.2581
STDGJ_07	615	54	598	12	593	13	631	22	0.80164	0.01039	0.09638	0.00107	10.375	1.111	0.0603	1.2603
STDGJ_08	599	54	602	12	603	13	608	22	0.80873	0.01054	0.09799	0.00109	10.205	1.114	0.0599	1.2659
STDGJ_09	624	54	608	12	604	13	594	22	0.81967	0.01090	0.09817	0.00111	10.186	1.135	0.0606	1.2741
STDGJ_10	619	55	603	13	599	14	607	23	0.81042	0.01136	0.09729	0.00117	10.279	1.201	0.0604	1.2954
STDGJ_11	594	54	599	12	600	13	611	22	0.80321	0.01056	0.09750	0.00111	10.257	1.134	0.0598	1.2540
STDGJ_12	605	55	594	12	591	13	648	24	0.79431	0.01072	0.09594	0.00111	10.423	1.152	0.0601	1.2793
STDGJ_13	602	54	610	12	612	13	620	23	0.82264	0.01083	0.09952	0.00113	10.049	1.133	0.0600	1.2575
STDGJ_14	596	54	600	12	601	13	604	22	0.80495	0.01057	0.09764	0.00111	10.242	1.133	0.0598	1.2533
STDGJ_15	605	55	614	12	616	13	610	23	0.83031	0.01115	0.10033	0.00115	9.967	1.144	0.0600	1.2801
STDGJ_16	598	55	603	12	604	13	579	22	0.81113	0.01086	0.09830	0.00112	10.173	1.143	0.0599	1.2753
STDGJ_17	611	56	586	12	580	13	615	24	0.78108	0.01069	0.09410	0.00108	10.627	1.148	0.0602	1.3105
STDGJ_18	622	56	605	12	600	13	655	25	0.81433	0.01108	0.09760	0.00112	10.246	1.147	0.0605	1.3003
STDGJ_19	629	58	591	13	582	13	596	24	0.79045	0.01124	0.09447	0.00111	10.585	1.171	0.0607	1.3605
STDGJ_20	609	55	609	13	609	14	633	24	0.82103	0.01121	0.09902	0.00115	10.099	1.162	0.0602	1.2933
STDGJ_21	589	55	606	12	611	14	597	22	0.81634	0.01104	0.09935	0.00115	10.065	1.160	0.0596	1.2790
STDGJ_22	613	54	600	12	597	13	620	23	0.80595	0.01084	0.09702	0.00112	10.307	1.159	0.0603	1.2698
STDGJ_23	590	57	620	13	629	14	616	25	0.84216	0.01195	0.10251	0.00123	9.755	1.200	0.0596	1.3234
STDGJ_24	626	68	558	14	542	13	616	31	0.73171	0.01208	0.08763	0.00109	11.411	1.238	0.0606	1.5952
STDGJ_25	626	69	615	15	613	15	599	33	0.83306	0.01393	0.09975	0.00124	10.025	1.243	0.0606	1.6199
STDGJ_26	628	76	600	16	593	14	610	37	0.80577	0.01462	0.09638	0.00122	10.375	1.269	0.0607	1.7820
STDGJ_27	661	24	601	4	614	5	629	14	0.83031	0.00442	0.09776	0.00031	10.229	0.313	0.0616	0.5581
STDGJ_28	625	21	602	3	607	4	602	12	0.81819	0.00390	0.09795	0.00030	10.209	0.303	0.0606	0.4961
STDGJ_29	611	23	594	3	598	5	601	12	0.80110	0.00406	0.09650	0.00029	10.363	0.306	0.0602	0.5294
STDGJ_30	675	21	555	3	580	4	583	11	0.76953	0.00370	0.08997	0.00027	11.114	0.302	0.0620	0.5010
STDGJ_31	599	23	595	3	595	5	611	12	0.79741	0.00401	0.09661	0.00030	10.351	0.307	0.0599	0.5233
STDGJ_32	656	22	600	4	612	5	616	12	0.82642	0.00413	0.09752	0.00030	10.255	0.307	0.0615	0.5209
STDGJ_33	600	29	601	4	601	6	606	16	0.80665	0.00517	0.09768	0.00033	10.237	0.338	0.0599	0.6730
STDGJ_34	618	29	600	4	604	6	617	16	0.81256	0.00530	0.09757	0.00033	10.249	0.341	0.0604	0.6858
STDGJ_35	622	23	601	4	605	5	627	13	0.81478	0.00414	0.09766	0.00030	10.240	0.309	0.0605	0.5289
STDGJ_36	593	22	600	4	599	5	598	12	0.80351	0.00407	0.09761	0.00030	10.245	0.308	0.0597	0.5265
STDGJ_37	577	24	607	4	600	5	621	14	0.80640	0.00436	0.09868	0.00031	10.134	0.315	0.0593	0.5643
STDGJ_38	609	24	601	4	602	5	614	14	0.80974	0.00435	0.09766	0.00031	10.239	0.314	0.0601	0.5607
STDGJ_39	612	30	598	4	601	6	591	16	0.80693	0.00531	0.09718	0.00033	10.291	0.342	0.0602	0.6944
STDGJ_40	613	30	598	4	601	6	617	17	0.80718	0.00542	0.09716	0.00034	10.292	0.345	0.0603	0.7085
STDGJ_41	601	31	605	4	604	6	628	18	0.81317	0.00560	0.09842	0.00034	10.160	0.349	0.0599	0.7275

Mud Tank

	RATIOS							
Analysis No.	$^{207}Pb/^{206}Pb$	+/-2s	$^{207}Pb/^{235}U$	+/-2s	$^{206}Pb/^{238}U$	+/-2s	$^{208}Pb/^{232}Th$	+/-2s
MT-01	0.06331	0.00342	0.99037194	0.05213416	0.11346	0.00323	0.03586	0.00254
MT-02	0.06365	0.00202	1.04146838	0.03322258	0.11868	0.00277	0.03657	0.00144
MT-03	0.06337	0.00174	1.06350553	0.03004016	0.12173	0.00280	0.03425	0.00087
MT-04	0.06250	0.00224	1.03349912	0.03655936	0.11994	0.00284	0.03581	0.00109
MT-05	0.06609	0.00303	1.15666521	0.05200608	0.12695	0.00340	0.03830	0.00124
MT-06	0.06229	0.00179	1.02936029	0.03058038	0.11988	0.00284	0.03344	0.00087
MT-07	0.06382	0.00199	1.06360567	0.0344899	0.12098	0.00299	0.03380	0.00103
MT-08	0.06420	0.00087	1.02111614	0.01316542	0.11537	0.00081	0.03560	0.00054
MT-09	0.06404	0.00102	1.0451889	0.01574877	0.11838	0.00089	0.03624	0.00062
MT-10	0.06346	0.00078	1.0455786	0.0122382	0.11950	0.00079	0.03664	0.00050

91500

	RATIOS							
Analysis No.	$^{207}Pb/^{206}Pb$	+/-2s	$^{207}Pb/^{235}U$	+/-2s	$^{206}Pb/^{238}U$	+/-2s	$^{208}Pb/^{232}Th$	+/-2s
91500-01	0.07788	0.00264	1.88161	0.06343	0.17523	0.00418	0.05734	0.00272
91500-02	0.07319	0.00221	1.91984	0.05902	0.19027	0.00455	0.05170	0.00169
91500-03	0.07492	0.00245	1.89477	0.06053	0.18345	0.00420	0.05508	0.00195
91500-04	0.07349	0.00231	1.91545	0.06100	0.18907	0.00456	0.05456	0.00181
91500-05	0.07337	0.00102	0.18190	0.00216	1.83962	0.02667	0.05167	0.00076
91500-06	0.07225	0.00110	1.83627	0.02906	0.18451	0.00229	0.05332	0.00091
91500-07	0.07754	0.00088	1.83682	0.01990	0.17181	0.00114	0.05280	0.00083
91500-08	0.07516	0.00099	1.82967	0.02288	0.17657	0.00124	0.05213	0.00094
91500-09	0.07479	0.00097	1.85816	0.02289	0.18021	0.00126	0.05342	0.00092
91500-10	0.07609	0.00096	1.88702	0.02282	0.17989	0.00125	0.05502	0.00102

Mud Tank

	AGES (Ma)								NORMAL CONCORDIA PLOT DATA				INVERSE CONCORDIA PLOT DATA			
Analysis No.	$^{207}Pb/^{206}Pb$	+/-2s	$^{207}Pb/^{235}U$	+/-2s	$^{206}Pb/^{238}U$	+/-2s	$^{208}Pb/^{232}Th$	+/-2s	$^{207}Pb/^{235}U$	1s	$^{206}Pb/^{238}U$	1s	$^{238}U/^{206}Pb$	RSD	$^{207}Pb/^{206}Pb$	RSD
MT-01	719	113	699	27	693	19	712	50	0.9904	0.0261	0.1135	0.0016	8.814	1.422	0.0633	2.7026
MT-02	730	67	725	17	723	16	726	28	1.0415	0.0166	0.1187	0.0014	8.426	1.168	0.0636	1.5902
MT-03	721	58	736	15	741	16	681	17	1.0635	0.0150	0.1217	0.0014	8.215	1.151	0.0634	1.3748
MT-04	691	76	721	18	730	16	711	21	1.0335	0.0183	0.1199	0.0014	8.338	1.185	0.0625	1.7956
MT-05	809	95	780	24	770	19	760	24	1.1567	0.0260	0.1269	0.0017	7.877	1.338	0.0661	2.2957
MT-06	684	61	719	15	730	16	665	17	1.0294	0.0153	0.1199	0.0014	8.341	1.183	0.0623	1.4337
MT-07	736	65	736	17	736	17	672	20	1.0636	0.0172	0.1210	0.0015	8.266	1.238	0.0638	1.5621
MT-08	748	28	704	5	715	7	707	11	1.0211	0.0066	0.1154	0.0004	8.6678	0.350	0.0642	0.6761
MT-09	743	33	721	5	727	8	720	12	1.0452	0.0079	0.1184	0.0004	8.4472	0.374	0.0640	0.7933
MT-10	724	26	728	5	727	6	727	10	1.0456	0.0061	0.1195	0.0004	8.3681	0.330	0.0635	0.6117

	AGES (Ma)								NORMAL CONCORDIA PLOT DATA				INVERSE CONCORDIA PLOT DATA			
Analysis No.	$^{207}Pb/^{206}Pb$	+/-2s	$^{207}Pb/^{235}U$	+/-2s	$^{206}Pb/^{238}U$	+/-2s	$^{208}Pb/^{232}Th$	+/-2s	$^{207}Pb/^{235}U$	1s	$^{206}Pb/^{238}U$	1s	$^{238}U/^{206}Pb$	RSD	$^{207}Pb/^{206}Pb$	RSD
91500-01	1144	67	1075	22	1041	23	1127	52	1.8816	0.0317	0.1752	0.0021	5.7069	1.193	0.0779	1.6947
91500-02	1019	60	1088	21	1123	25	1019	32	1.9198	0.0295	0.1903	0.0023	5.2557	1.197	0.0732	1.5066
91500-03	1066	65	1079	21	1086	23	1084	37	1.8948	0.0303	0.1835	0.0021	5.4510	1.145	0.0749	1.6341
91500-04	1027	62	1087	21	1116	25	1074	35	1.9155	0.0305	0.1891	0.0023	5.2891	1.205	0.0735	1.5698
91500-05	1024	28	1077	12	1060	10	1018	15	0.1819	0.0011	1.8396	0.0133	0.5436	0.725	0.0734	0.6976
91500-06	993	31	1092	12	1059	10	1050	17	1.8363	0.0145	0.1845	0.0011	5.4198	0.620	0.0722	0.7596
91500-07	1135	22	1022	6	1059	7	1040	16	1.8368	0.0099	0.1718	0.0006	5.8203	0.331	0.0775	0.5682
91500-08	1073	26	1048	7	1056	8	1027	18	1.8297	0.0114	0.1766	0.0006	5.6634	0.352	0.0752	0.6588
91500-09	1063	26	1068	7	1066	8	1052	18	1.8582	0.0114	0.1802	0.0006	5.5491	0.350	0.0748	0.6474
91500-10	1097	25	1066	7	1077	8	1083	20	1.8870	0.0114	0.1799	0.0006	5.5590	0.347	0.0761	0.6332

A3.6. Sr isotopic composition of the Ice River perovskite standard using LA-MC-ICP-MS.

$Sr_i = {}^{87}Sr/{}^{86}Sr_s - ({}^{87}Rb/{}^{86}Sr_s \times e^{\lambda t}-1)$

where s=sample; λ=0.01420/Ga; t=age (in Ga) calculated for each kimberlite in this study

Average values (weighted average)

Sr	Exp factor	$^{87}Sr/^{86}Sr$_corr	$^{86}Sr/^{88}Sr_{(m)}$	$^{84}Sr/^{86}Sr$_corr	Rb^{85} (V)	$^{87}Sr/^{86}Sr$_Rb corr	$^{87}Rb/^{86}Sr_{\_Rb\ corr}$	Sr intensity	Kr^{83} Intensity
	-1.755 ± 0.031	0.70337±0.00032	0.114679±0.000081	0.05564±0.00013	1.13E-06±1.8E-06	0.70313±0.00030	1.51E-05±2.4E-05	0.285±0.022	2.106E-05±1.7E-06

Data

Sample	Exp factor		$^{87}Sr/^{86}Sr$_corr		$^{86}Sr/^{88}Sr_{(m)}$		$^{84}Sr/^{86}Sr$_corr		Rb^{85} (V)		$^{87}Sr/^{86}Sr$_Rb corr		$^{87}Rb/^{86}Sr_{\_Rb\ corr}$		Sr intensity		Kr^{83} Intensity	
	Exp factor	1σ	87/86 uncorr	1σ	86/88 corr	1σ	84/86 corr	1σ	Rb85 (V)	1σ	87/86 Rb corr	1σ	87Rb/86Sr	1σ	Sr intensity	1σ	Kr^{83} Intensity	1se
IR-14-08	-1.8485	0.0120	0.70361	0.00009	0.11444	0.00003	0.05475	0.00020	0.00E+00	0.00E+00	0.70292	0.00018	0.00000	0.00000	0.25587	0.00970	2.74E-05	3.70E-06
IR-14-09	-1.7036	0.0160	0.70266	0.00017	0.11482	0.00004	0.05755	0.00033	6.41E-06	3.40E-06	0.70182	0.00035	0.00016	0.00008	0.18920	0.00410	1.36E-05	3.60E-06
IR-14-11	-1.8390	0.0140	0.70267	0.00019	0.11446	0.00004	0.05594	0.00024	0.00E+00	0.00E+00	0.70298	0.00034	0.00000	0.00000	0.19896	0.00620	2.23E-05	2.70E-06
IR-14-12	-1.8375	0.0110	0.70241	0.00023	0.11447	0.00003	0.05644	0.00022	0.00E+00	0.00E+00	0.70270	0.00030	0.00000	0.00000	0.18758	0.00510	1.38E-05	2.40E-06
IR-14-13	-1.7751	0.0240	0.70144	0.00031	0.11463	0.00006	0.05882	0.00053	1.12E-05	2.40E-06	0.70152	0.00056	0.00050	0.00011	0.09081	0.00350	1.45E-05	2.80E-06
IR-14-14	-1.8423	0.0240	0.70269	0.00029	0.11445	0.00006	0.05571	0.00027	0.00E+00	0.00E+00	0.70289	0.00043	0.00000	0.00000	0.18697	0.00300	1.74E-05	3.60E-06
IR-14-15	-1.7886	0.0100	0.70168	0.00023	0.11459	0.00003	0.05633	0.00023	0.00E+00	0.00E+00	0.70239	0.00030	0.00000	0.00000	0.19189	0.00440	2.25E-05	2.50E-06
IR-14-16	-1.8066	0.0086	0.70099	0.00014	0.11455	0.00002	0.05637	0.00018	0.00E+00	0.00E+00	0.70083	0.00025	0.00000	0.00000	0.18372	0.00440	1.33E-05	2.30E-06
IR-14-17	-1.9366	0.0130	0.70173	0.00018	0.11421	0.00003	0.05576	0.00022	8.58E-06	3.10E-06	0.70105	0.00036	0.00017	0.00007	0.17938	0.00450	1.81E-05	3.20E-06
IR-14-17	-1.9364	0.0094	0.70169	0.00014	0.11421	0.00003	0.05569	0.00020	7.88E-06	2.80E-06	0.70123	0.00031	0.00018	0.00007	0.18582	0.00530	2.02E-05	3.00E-06
IR-14-18	-2.0313	0.0160	0.70414	0.00020	0.11396	0.00004	0.05704	0.00027	0.00E+00	0.00E+00	0.70445	0.00034	0.00000	0.00000	0.15879	0.00350	1.58E-05	3.20E-06
IR-14-19	-2.0465	0.0150	0.70402	0.00018	0.11392	0.00004	0.05472	0.00022	4.69E-06	3.40E-06	0.70296	0.00032	0.00012	0.00009	0.16878	0.00410	1.75E-05	3.40E-06
IR-14-19	-2.0465	0.0150	0.70402	0.00018	0.11392	0.00004	0.05472	0.00022	4.69E-06	3.40E-06	0.70296	0.00032	0.00012	0.00009	0.16878	0.00410	1.75E-05	3.40E-06
IR-14-20	-1.8813	0.0120	0.70340	0.00011	0.11435	0.00003	0.05683	0.00024	0.00E+00	0.00E+00	0.70384	0.00028	0.00000	0.00000	0.19708	0.00570	1.78E-05	3.40E-06
IR-14-21	-2.1264	0.0110	0.70512	0.00024	0.11371	0.00003	0.05470	0.00032	0.00E+00	0.00E+00	0.70417	0.00024	0.00000	0.00000	0.17239	0.00480	1.41E-05	2.20E-06
IR-14-21	-1.9619	0.0150	0.70395	0.00018	0.11414	0.00004	0.05651	0.00029	5.46E-06	3.30E-06	0.70310	0.00035	0.00017	0.00008	0.19141	0.00550	2.12E-05	3.00E-06
IR-14-22	-1.8400	0.0150	0.70381	0.00018	0.11446	0.00004	0.05475	0.00028	7.54E-07	2.50E-06	0.70433	0.00030	0.00002	0.00006	0.19472	0.00580	1.56E-05	3.00E-06
IR-14-25	-2.0605	0.0130	0.70520	0.00021	0.11388	0.00003	0.05753	0.00026	0.00E+00	0.00E+00	0.70527	0.00026	0.00000	0.00000	0.19458	0.00550	5.68E-06	2.30E-06
IR-14-24	-2.0605	0.0130	0.70520	0.00021	0.11388	0.00003	0.05753	0.00026	0.00E+00	0.00E+00	0.70527	0.00026	0.00000	0.00000	0.19458	0.00550	5.68E-06	2.30E-06
IR-14-25	-1.8452	0.0120	0.70494	0.00016	0.11445	0.00003	0.05741	0.00023	1.18E-06	3.30E-06	0.70475	0.00034	-0.00001	0.00008	0.18495	0.00530	9.50E-06	3.40E-06
IR-14-26	-1.7005	0.0130	0.70298	0.00017	0.11483	0.00004	0.05601	0.00021	0.00E+00	0.00E+00	0.70288	0.00031	0.00000	0.00000	0.19874	0.00560	1.29E-05	1.90E-06
IR-14-27	-1.6647	0.0110	0.70272	0.00022	0.11492	0.00003	0.05712	0.00021	0.00E+00	0.00E+00	0.70320	0.00027	0.00000	0.00000	0.19779	0.00430	2.19E-05	3.00E-06
IR-14-29	-1.8654	0.0160	0.70169	0.00023	0.11439	0.00004	0.05615	0.00030	0.00E+00	0.00E+00	0.70159	0.00041	0.00000	0.00000	0.15951	0.00550	2.76E-05	2.90E-06
IR-14-30	-1.7809	0.0065	0.70289	0.00012	0.11461	0.00002	0.05592	0.00012	4.16E-07	3.20E-06	0.70282	0.00017	0.00000	0.00004	0.35320	0.00530	3.03E-05	2.20E-06
IR-14-31	-1.7100	0.0079	0.70287	0.00012	0.11480	0.00002	0.05575	0.00011	1.08E-06	2.90E-06	0.70305	0.00012	0.00001	0.00004	0.37461	0.00670	2.62E-05	3.10E-06
IR-14-32	-1.7068	0.0070	0.70253	0.00010	0.11481	0.00002	0.05602	0.00011	4.77E-06	2.70E-06	0.70243	0.00015	0.00004	0.00003	0.36896	0.00590	2.42E-05	2.30E-06
IR-14-33	-1.7134	0.0064	0.70242	0.00012	0.11479	0.00002	0.05578	0.00017	0.00E+00	0.00E+00	0.70246	0.00015	0.00000	0.00000	0.36924	0.00590	2.76E-05	2.50E-06
IR-14-34	-1.7686	0.0066	0.70401	0.00010	0.11465	0.00002	0.05649	0.00008	2.78E-06	2.70E-06	0.70381	0.00014	0.00003	0.00003	0.37565	0.00610	1.82E-05	2.70E-06
IR-14-35	-1.7454	0.0084	0.70316	0.00006	0.11471	0.00002	0.05549	0.00012	7.19E-06	2.90E-06	0.70316	0.00017	0.00008	0.00003	0.39206	0.00850	2.45E-05	3.70E-06
IR-14-36	-1.7335	0.0054	0.70306	0.00009	0.11474	0.00001	0.05577	0.00008	0.00E+00	0.00E+00	0.70286	0.00012	0.00000	0.00000	0.36637	0.00500	1.89E-05	3.40E-06
IR-14-36	-1.7363	0.0061	0.70311	0.00011	0.11473	0.00002	0.05577	0.00010	0.00E+00	0.00E+00	0.70285	0.00011	0.00000	0.00000	0.36630	0.00510	1.86E-05	3.10E-06
IR-14-37	-1.7488	0.0092	0.70326	0.00011	0.11470	0.00002	0.05541	0.00013	0.00E+00	0.00E+00	0.70280	0.00016	0.00000	0.00000	0.38471	0.00780	2.64E-05	3.20E-06
IR-14-38	-1.7005	0.0069	0.70319	0.00011	0.11483	0.00002	0.05601	0.00020	0.00E+00	0.00E+00	0.70289	0.00015	0.00000	0.00000	0.38453	0.00480	3.58E-05	2.50E-06
IR-14-39	-1.8381	0.0052	0.70413	0.00010	0.11446	0.00001	0.05617	0.00014	1.62E-05	2.90E-06	0.70376	0.00027	0.00021	0.00004	0.32997	0.00550	2.46E-05	3.50E-06
IR-14-40	-1.8648	0.0092	0.70425	0.00008	0.11439	0.00002	0.05563	0.00014	1.28E-06	3.20E-06	0.70374	0.00013	0.00002	0.00004	0.35538	0.00660	1.07E-05	2.60E-06
IR-14-41	-1.7658	0.0100	0.70202	0.00019	0.11465	0.00003	0.05574	0.00026	3.44E-06	6.50E-06	0.70155	0.00032	0.00004	0.00009	0.32397	0.00370	3.05E-05	4.80E-06
IR-14-43	-1.7999	0.0073	0.70213	0.00012	0.11456	0.00002	0.05588	0.00013	0.00E+00	0.00E+00	0.70228	0.00020	0.00000	0.00000	0.34378	0.00380	3.34E-05	2.80E-06
IR-14-47	-1.8399	0.0075	0.70315	0.00011	0.11446	0.00002	0.05580	0.00015	9.54E-06	2.80E-06	0.70281	0.00016	0.00013	0.00004	0.31999	0.00420	1.77E-05	1.70E-06
IR-14-49	-1.8308	0.0082	0.70362	0.00014	0.11448	0.00002	0.05561	0.00012	8.79E-06	3.40E-06	0.70338	0.00022	0.00013	0.00005	0.34304	0.00510	2.21E-05	3.50E-06
IR-14-50	-1.8779	0.0071	0.70380	0.00012	0.11436	0.00002	0.05470	0.00018	6.70E-06	4.60E-06	0.70307	0.00018	0.00005	0.00006	0.35678	0.00690	2.76E-05	3.70E-06
IR-14-53	-1.8416	0.0069	0.70361	0.00009	0.11445	0.00002	0.05539	0.00013	1.05E-05	3.10E-06	0.70336	0.00019	0.00013	0.00004	0.36207	0.00640	2.52E-05	2.60E-06
IR-14-57	-1.8043	0.0069	0.70277	0.00011	0.11455	0.00002	0.05547	0.00011	0.00E+00	0.00E+00	0.70232	0.00022	0.00000	0.00000	0.35104	0.00550	3.08E-05	2.90E-06
IR-14-58	-1.8270	0.0089	0.70242	0.00014	0.11449	0.00002	0.05533	0.00012	4.73E-06	3.00E-06	0.70241	0.00018	0.00008	0.00004	0.35433	0.00610	2.87E-05	3.40E-06
IR-14-59	-1.8250	0.0100	0.70231	0.00014	0.11450	0.00003	0.05522	0.00013	0.00E+00	0.00E+00	0.70184	0.00025	0.00000	0.00000	0.34983	0.00270	2.74E-05	3.70E-06
IR-14-62	-1.8431	0.0073	0.70385	0.00010	0.11445	0.00002	0.05540	0.00014	4.92E-06	2.60E-06	0.70356	0.00017	0.00008	0.00003	0.36607	0.00710	1.88E-05	3.10E-06
IR-14-63	-1.7511	0.0078	0.70342	0.00011	0.11469	0.00002	0.05606	0.00012	5.63E-06	2.50E-06	0.70381	0.00016	0.00006	0.00003	0.35537	0.00640	2.94E-05	3.20E-06

A3.6. Sr isotopic composition of the Ice River perovskite standard using LA-MC-ICP-MS.

Sample	Exp factor		$^{87}Sr/^{86}Sr$_corr		$^{86}Sr/^{88}Sr_{(m)}$		$^{84}Sr/^{86}Sr$_corr		Rb^{85} (V)		$^{87}Sr/^{86}Sr$_Rb corr		$^{87}Rb/^{86}Sr_{\_Rb\ corr}$		Sr intensity		Kr^{83} Intensity	
	Exp factor	1σ	87/86 uncorr	1σ	86/88 corr	1σ	84/86 corr	1σ	Rb85 (V)	1σ	87/86 Rb corr	1σ	87Rb/86Sr	1σ	Sr intensity	1σ	Kr^{83} Intensity	1se
IR-14-64	-1.8454	0.0058	0.70401	0.00014	0.11444	0.00002	0.05557	0.00011	7.94E-06	3.00E-06	0.70322	0.00018	0.00011	0.00003	0.35472	0.00520	1.44E-05	3.90E-06
IR-14-65	-1.9496	0.0160	0.70577	0.00020	0.11417	0.00004	0.05645	0.00031	2.84E-06	6.00E-06	0.70498	0.00037	0.00004	0.00008	0.33971	0.00240	2.85E-05	5.90E-06
IR-14-66	-1.9071	0.0052	0.70548	0.00009	0.11428	0.00001	0.05599	0.00011	0.00E+00	0.00E+00	0.70603	0.00016	0.00000	0.00000	0.38492	0.00770	2.29E-05	3.90E-06
IR-14-67	-2.0188	0.0057	0.71111	0.00010	0.11399	0.00002	0.05626	0.00013	1.17E-05	3.00E-06	0.71070	0.00017	0.00015	0.00004	0.35949	0.00650	2.40E-05	3.60E-06
IR-14-68	-1.6315	0.0065	0.70235	0.00013	0.11501	0.00002	0.05531	0.00014	0.00E+00	0.00E+00	0.70213	0.00017	0.00000	0.00000	0.37274	0.00620	2.65E-05	3.00E-06
IR-14-69	-1.7109	0.0093	0.70351	0.00010	0.11480	0.00002	0.05532	0.00010	1.73E-05	3.90E-06	0.70324	0.00017	0.00020	0.00004	0.36789	0.00610	1.50E-05	3.10E-06
IR-14-69	-1.7109	0.0093	0.70351	0.00010	0.11480	0.00002	0.05532	0.00010	1.73E-05	3.90E-06	0.70324	0.00017	0.00020	0.00004	0.36789	0.00610	1.50E-05	3.10E-06
IR-14-71	-1.6607	0.0065	0.70287	0.00011	0.11493	0.00002	0.05532	0.00014	0.00E+00	0.00E+00	0.70271	0.00017	0.00000	0.00000	0.36541	0.00430	1.87E-05	3.60E-06
IR-14-74	-1.6714	0.0075	0.70301	0.00010	0.11489	0.00002	0.05489	0.00012	0.00E+00	0.00E+00	0.70268	0.00017	0.00000	0.00000	0.39667	0.00680	3.12E-05	2.50E-06
IR-14-76	-1.6541	0.0074	0.70296	0.00012	0.11495	0.00002	0.05481	0.00009	0.00E+00	0.00E+00	0.70232	0.00015	0.00000	0.00000	0.37554	0.00710	2.72E-05	2.70E-06
IR-14-77	-1.6498	0.0055	0.70335	0.00010	0.11496	0.00002	0.05493	0.00013	7.27E-07	2.80E-06	0.70315	0.00015	0.00000	0.00003	0.37315	0.00770	2.44E-05	2.20E-06
IR-14-78	-1.6256	0.0071	0.70280	0.00007	0.11502	0.00002	0.05531	0.00014	0.00E+00	0.00E+00	0.70289	0.00012	0.00000	0.00000	0.37985	0.00740	3.35E-05	2.80E-06
IR-14-79	-1.6107	0.0063	0.70279	0.00012	0.11506	0.00002	0.05577	0.00009	0.00E+00	0.00E+00	0.70281	0.00017	0.00000	0.00000	0.38067	0.00700	1.85E-05	2.50E-06
IR-14-80	-1.5990	0.0097	0.70300	0.00009	0.11509	0.00003	0.05532	0.00010	6.37E-06	4.20E-06	0.70283	0.00013	0.00006	0.00005	0.36622	0.00740	9.02E-06	3.20E-06
IR-14-81	-1.5695	0.0077	0.70251	0.00010	0.11517	0.00002	0.05608	0.00014	9.91E-06	2.70E-06	0.70239	0.00014	0.00014	0.00004	0.34433	0.00540	2.21E-05	2.80E-06
IR-14-82	-1.5629	0.0088	0.70285	0.00012	0.11519	0.00002	0.05537	0.00009	3.99E-06	3.10E-06	0.70307	0.00016	0.00004	0.00004	0.37206	0.00620	2.44E-05	3.00E-06
IR-14-83	-1.5619	0.0082	0.70312	0.00008	0.11519	0.00002	0.05581	0.00012	7.63E-06	3.60E-06	0.70301	0.00014	0.00009	0.00004	0.37905	0.00700	2.54E-05	3.50E-06
IR-14-85	-1.5795	0.0056	0.70289	0.00010	0.11515	0.00002	0.05505	0.00015	1.13E-05	3.10E-06	0.70262	0.00014	0.00014	0.00004	0.34638	0.00540	1.47E-05	3.10E-06
IR-14-86	-1.5905	0.0088	0.70284	0.00014	0.11512	0.00002	0.05506	0.00012	0.00E+00	0.00E+00	0.70228	0.00015	0.00000	0.00000	0.35252	0.00610	3.12E-05	3.60E-06
IR-14-87	-1.5886	0.0110	0.70291	0.00009	0.11512	0.00003	0.05562	0.00015	0.00E+00	0.00E+00	0.70283	0.00019	0.00000	0.00000	0.35370	0.00420	2.30E-05	3.40E-06
IR-14-88	-1.6032	0.0058	0.70301	0.00011	0.11508	0.00002	0.05563	0.00009	0.00E+00	0.00E+00	0.70318	0.00016	0.00000	0.00000	0.37331	0.00630	2.77E-05	3.40E-06
IR-14-89	-1.5944	0.0080	0.70297	0.00011	0.11511	0.00002	0.05558	0.00012	7.49E-06	3.00E-06	0.70285	0.00015	0.00007	0.00003	0.38071	0.00660	2.81E-05	2.50E-06
IR-14-90	-1.5857	0.0091	0.70325	0.00008	0.11513	0.00002	0.05506	0.00012	1.18E-05	2.40E-06	0.70309	0.00016	0.00014	0.00003	0.37280	0.00800	2.28E-05	2.60E-06
	-1.7823	**0.0097**	**0.70330**	**0.00014**	**0.11461**	**0.00003**	**0.05581**	**0.00017**	**0.00000**	**0.00000**	**0.70311**	**0.00022**	**0.00006**	**0.00003**	**0.30347**	**0.00565**	**0.00002**	**0.00000**
	0.1402	**0.0040**	**0.00134**	**0.00005**	**0.00037**	**0.00001**	**0.00079**	**0.00008**	**0.00000**	**0.00000**	**0.00133**	**0.00009**	**0.00008**	**0.00003**	**0.08764**	**0.00140**	**0.00001**	**0.00000**

A3.6. Nd isotopic composition of the Ice River perovskite standard obtained using LA-MC-ICP-MS.

ε_{Nd} (t)= (($^{143}Nd/^{144}Nd)_s$-($^{147}Sm/^{144}Nd)_s$ x ($e^{\lambda t}$-1))/(($^{143}Nd/^{144}Nd)_{CHUR}$-($^{147}Sm/^{144}Nd)_{CHUR}$ x ($e^{\lambda t}$-1))-1)x10000

where s=sample; $(^{143}Nd/^{144}Nd)_{CHUR}$ = 0.512638; and $(^{147}Sm/^{144}Nd)_{CHUR}$=0.1967; λ=0.00654/Ga for ^{147}Sm; t=age (in Ga) calculated for each kimberlite in this study

Average values (weighted average)

Nd	$^{142}Nd/^{144}Nd_{\_Corr}$	$^{143}Nd/^{144}Nd_{Corr}$	$^{145}Nd/^{144}Nd_{Corr}$	$^{149}Nd/^{144}Nd_{Corr}$	$^{150}Nd/^{144}Nd_{Corr}$	Exp Factor	Total Nd	^{147}Sm	^{147}Sm / ^{144}Nd
	2.5265 ± 0.008	0.512607 ± 0.000021	0.348328 ± 0.000015	0.241299 ± 0.000025	0.235948 ± 0.000046	-2.13 ± 0.022	1.363 ± 0.022	0.02757 ± 0.00046	0.08398 ± 0.00014

Data

Nd	$^{142}Nd/^{144}Nd_{\_Corr}$		$^{143}Nd/^{144}Nd_{Corr}$		$^{145}Nd/^{144}Nd_{Corr}$		$^{149}Nd/^{144}Nd_{Corr}$		$^{150}Nd/^{144}Nd_{Corr}$		Exp Factor		Total Nd		^{147}Sm		^{147}Sm / ^{144}Nd	
	142/144 Corr	1σ	143/144 Corr	1σ	145/144 Corr	1σ	149/144 Corr	1σ	150/144 Corr	1σ	Exp Factor	1σ	Total Nd	1σ	Sm 147	1σ	Sm 147/ Nd 144	1σ
IR-14-98	2.5036	0.0035	0.51243	0.00004	0.34845	0.00003	0.24159	0.00006	0.23636	0.00012	-2.2148	0.0079	1.41535	0.01700	0.02883	0.00033	0.08448	0.00008
IR-14-99	2.4934	0.0028	0.51254	0.00004	0.34836	0.00003	0.24142	0.00006	0.23617	0.00011	-2.2139	0.0078	1.40632	0.02700	0.02880	0.00056	0.08481	0.00002
IR-14-100	2.4936	0.0065	0.51260	0.00004	0.34839	0.00003	0.24131	0.00005	0.23615	0.00013	-2.2134	0.0090	1.41676	0.02400	0.02904	0.00049	0.08497	0.00005
IR-14-101	2.5168	0.0028	0.51255	0.00002	0.34845	0.00003	0.24146	0.00005	0.23622	0.00007	-2.1949	0.0071	1.32310	0.02800	0.02685	0.00057	0.08407	0.00002
IR-14-102	2.5318	0.0042	0.51271	0.00004	0.34831	0.00004	0.24133	0.00007	0.23599	0.00011	-2.2053	0.0083	1.44559	0.02900	0.02919	0.00059	0.08363	0.00003
IR-14-103	2.5301	0.0029	0.51258	0.00005	0.34830	0.00004	0.24125	0.00007	0.23595	0.00014	-2.1941	0.0100	1.42392	0.02200	0.02885	0.00045	0.08386	0.00002
IR-14-104	2.5367	0.0082	0.51259	0.00003	0.34839	0.00003	0.24136	0.00006	0.23609	0.00012	-2.1881	0.0073	1.47363	0.02000	0.02993	0.00039	0.08427	0.00008
IR-14-105	2.5010	0.0047	0.51246	0.00004	0.34841	0.00003	0.24139	0.00006	0.23617	0.00010	-2.1718	0.0092	1.42789	0.02200	0.02925	0.00043	0.08490	0.00004
IR-14-106	2.5503	0.0070	0.51259	0.00004	0.34825	0.00003	0.24111	0.00005	0.23571	0.00008	-2.1742	0.0110	1.42591	0.02400	0.02905	0.00048	0.08444	0.00004
IR-14-107	2.5298	0.0030	0.51273	0.00003	0.34829	0.00004	0.24123	0.00007	0.23594	0.00008	-2.1046	0.0080	1.42700	0.02200	0.02865	0.00047	0.08316	0.00011
IR-14-108	2.5239	0.0035	0.51269	0.00003	0.34827	0.00002	0.24125	0.00005	0.23582	0.00009	-2.1251	0.0064	1.44600	0.02300	0.02885	0.00051	0.08253	0.00017
IR-14-109	2.5267	0.0037	0.51272	0.00004	0.34834	0.00004	0.24132	0.00006	0.23599	0.00017	-2.0810	0.0099	1.48700	0.02600	0.03021	0.00051	0.08420	0.00005
IR-14-110	2.5262	0.0046	0.51275	0.00004	0.34831	0.00003	0.24138	0.00005	0.23587	0.00012	-2.0552	0.0100	1.44598	0.02300	0.02924	0.00043	0.08394	0.00010
IR-14-111	2.5033	0.0040	0.51272	0.00004	0.34827	0.00004	0.24130	0.00008	0.23594	0.00018	-2.0605	0.0097	1.50256	0.02000	0.03015	0.00045	0.08307	0.00014
IR-14-112	2.5140	0.0051	0.51257	0.00004	0.34833	0.00003	0.24131	0.00004	0.23603	0.00008	-2.0864	0.0058	1.39608	0.03200	0.02758	0.00069	0.08176	0.00021
IR-14-113	2.5096	0.0035	0.51253	0.00004	0.34834	0.00002	0.24127	0.00004	0.23587	0.00012	-2.0814	0.0086	1.42067	0.02500	0.02812	0.00056	0.08197	0.00020
IR-14-114	2.5104	0.0071	0.51254	0.00004	0.34830	0.00005	0.24119	0.00007	0.23591	0.00016	-2.0669	0.0083	1.42948	0.02700	0.02909	0.00054	0.08438	0.00005
IR-14-115	2.5100	0.0075	0.51265	0.00004	0.34833	0.00003	0.24132	0.00008	0.23582	0.00010	-2.0318	0.0089	1.37517	0.02400	0.02810	0.00048	0.08486	0.00007
IR-14-116	2.5139	0.0046	0.51260	0.00003	0.34833	0.00004	0.24125	0.00006	0.23602	0.00010	-2.0326	0.0084	1.40082	0.02700	0.02808	0.00055	0.08318	0.00009
IR-14-117	2.5139	0.0046	0.51260	0.00003	0.34833	0.00004	0.24125	0.00006	0.23602	0.00010	-2.0326	0.0084	1.40082	0.02700	0.02808	0.00055	0.08318	0.00009
IR-14-118	2.5219	0.0083	0.51262	0.00005	0.34833	0.00003	0.24134	0.00005	0.23608	0.00015	-2.2734	0.0078	1.21731	0.02100	0.02445	0.00046	0.08385	0.00004
IR-14-119	2.5106	0.0086	0.51257	0.00005	0.34824	0.00002	0.24112	0.00005	0.23578	0.00016	-2.2947	0.0067	1.32789	0.00990	0.02673	0.00020	0.08330	0.00009
IR-14-120	2.4876	0.0024	0.51256	0.00007	0.34836	0.00003	0.24132	0.00005	0.23598	0.00019	-2.2785	0.0068	1.28819	0.01700	0.02585	0.00039	0.08300	0.00020
IR-14-121	2.4935	0.0071	0.51260	0.00005	0.34816	0.00004	0.24108	0.00007	0.23558	0.00013	-2.2866	0.0085	1.30741	0.02400	0.02640	0.00052	0.08348	0.00015
IR-14-122	2.5337	0.0022	0.51247	0.00006	0.34834	0.00003	0.24127	0.00006	0.23585	0.00021	-2.2550	0.0083	1.41793	0.01800	0.02854	0.00037	0.08332	0.00004
IR-14-123	2.5168	0.0018	0.51259	0.00004	0.34824	0.00003	0.24121	0.00006	0.23579	0.00013	-2.2441	0.0080	1.42354	0.02400	0.02873	0.00050	0.08350	0.00003
IR-14-124	2.5397	0.0040	0.51260	0.00005	0.34833	0.00004	0.24134	0.00006	0.23609	0.00014	-2.1649	0.0082	1.40296	0.01100	0.02801	0.00021	0.08236	0.00016
IR-14-125	2.5268	0.0068	0.51263	0.00003	0.34836	0.00003	0.24137	0.00006	0.23608	0.00011	-2.1141	0.0077	1.28215	0.02100	0.02609	0.00042	0.08433	0.00006
IR-14-126	2.5388	0.0027	0.51260	0.00004	0.34839	0.00003	0.24144	0.00004	0.23610	0.00020	-2.1001	0.0062	1.38863	0.02100	0.02832	0.00043	0.08453	0.00005
IR-14-127	2.5307	0.0031	0.51260	0.00005	0.34830	0.00003	0.24123	0.00006	0.23588	0.00023	-2.1394	0.0070	1.31614	0.01100	0.02683	0.00022	0.08443	0.00004
IR-14-128	2.5592	0.0081	0.51250	0.00004	0.34831	0.00003	0.24126	0.00006	0.23579	0.00015	-2.1018	0.0084	1.47979	0.02100	0.03022	0.00039	0.08422	0.00004
IR-14-129	2.5295	0.0024	0.51251	0.00005	0.34834	0.00004	0.24132	0.00007	0.23591	0.00018	-2.1108	0.0083	1.42887	0.01900	0.02920	0.00038	0.08470	0.00003
IR-14-130	2.5954	0.0069	0.51260	0.00003	0.34837	0.00003	0.24136	0.00005	0.23611	0.00011	-2.0824	0.0070	1.45248	0.02000	0.02907	0.00039	0.08305	0.00005
IR-14-131	2.5578	0.0043	0.51253	0.00004	0.34831	0.00003	0.24123	0.00006	0.23573	0.00014	-2.1036	0.0076	1.46004	0.03000	0.02964	0.00060	0.08415	0.00004
IR-14-132	2.5774	0.0025	0.51243	0.00004	0.34840	0.00004	0.24134	0.00005	0.23592	0.00012	-2.0924	0.0071	1.46958	0.02400	0.02952	0.00049	0.08324	0.00004
IR-14-133	2.5375	0.0048	0.51271	0.00003	0.34821	0.00003	0.24109	0.00005	0.23558	0.00010	-2.1160	0.0069	1.37005	0.03000	0.02789	0.00060	0.08432	0.00003
IR-14-134	2.5643	0.0041	0.51259	0.00003	0.34836	0.00003	0.24128	0.00005	0.23590	0.00014	-2.0935	0.0071	1.43559	0.02700	0.02913	0.00054	0.08411	0.00004
IR-14-135	2.5684	0.0052	0.51262	0.00003	0.34839	0.00003	0.24133	0.00005	0.23605	0.00011	-2.0665	0.0065	1.36505	0.03100	0.02771	0.00063	0.08419	0.00003
IR-14-136	2.5591	0.0029	0.51271	0.00003	0.34839	0.00003	0.24139	0.00006	0.23586	0.00008	-2.0604	0.0067	1.41873	0.02600	0.02880	0.00052	0.08419	0.00004
IR-14-137	2.5550	0.0030	0.51268	0.00006	0.34831	0.00003	0.24128	0.00005	0.23588	0.00022	-2.0670	0.0059	1.45542	0.02500	0.02961	0.00049	0.08439	0.00004
IR-14-138	2.5474	0.0040	0.51258	0.00006	0.34829	0.00002	0.24125	0.00003	0.23584	0.00022	-2.0657	0.0064	1.44117	0.03500	0.02919	0.00069	0.08409	0.00006
IR-14-139	2.5381	0.0036	0.51264	0.00004	0.34837	0.00003	0.24143	0.00005	0.23603	0.00014	-1.9946	0.0059	1.47956	0.02800	0.03005	0.00056	0.08434	0.00005
IR-14-140	2.5471	0.0035	0.51268	0.00004	0.34833	0.00002	0.24134	0.00004	0.23604	0.00009	-2.0249	0.0050	1.35052	0.03500	0.02735	0.00070	0.08403	0.00003
IR-14-141	2.5918	0.0030	0.51267	0.00006	0.34834	0.00004	0.24130	0.00006	0.23598	0.00025	-2.0916	0.0095	1.39416	0.02100	0.02795	0.00041	0.08315	0.00003

A3.6. Nd isotopic composition of the Ice River perovskite standard obtained using LA-MC-ICP-MS.

Nd	$^{142}Nd/^{144}Nd_{\_Corr}$		$^{143}Nd/^{144}Nd_{Corr}$		$^{145}Nd/^{144}Nd_{Corr}$		$^{149}Nd/^{144}Nd_{Corr}$		$^{150}Nd/^{144}Nd_{Corr}$		Exp Factor		Total Nd		^{147}Sm		^{147}Sm / ^{144}Nd	
	142/144 Corr	1σ	143/144 Corr	1σ	145/144 Corr	1σ	149/144 Corr	1σ	150/144 Corr	1σ	Exp Factor	1σ	Total Nd	1σ	Sm 147	1σ	Sm 147/ Nd 144	1σ
IR-14-142	2.5707	0.0038	0.51265	0.00004	0.34828	0.00002	0.24121	0.00005	0.23584	0.00018	-2.1264	0.0059	1.39087	0.02000	0.02801	0.00039	0.08342	0.00003
IR-14-143	2.5372	0.0044	0.51272	0.00004	0.34828	0.00003	0.24125	0.00005	0.23582	0.00007	-2.2569	0.0061	1.30544	0.02500	0.02616	0.00049	0.08298	0.00004
IR-14-144	2.5283	0.0049	0.51246	0.00005	0.34831	0.00004	0.24132	0.00006	0.23585	0.00010	-2.2621	0.0091	1.24108	0.01800	0.02505	0.00038	0.08355	0.00004
IR-14-145	2.5350	0.0037	0.51256	0.00005	0.34837	0.00003	0.24132	0.00005	0.23611	0.00016	-2.2525	0.0073	1.27733	0.01800	0.02568	0.00036	0.08327	0.00006
IR-14-146	2.4393	0.0041	0.51268	0.00003	0.34817	0.00007	0.24110	0.00007	0.23565	0.00011	-2.3462	0.0100	1.14220	0.02400	0.02283	0.00053	0.08254	0.00023
IR-14-147	2.4382	0.0043	0.51273	0.00003	0.34825	0.00003	0.24120	0.00005	0.23584	0.00010	-2.3155	0.0065	1.22904	0.02600	0.02453	0.00056	0.08249	0.00016
IR-14-148	2.4485	0.0054	0.51259	0.00004	0.34834	0.00004	0.24128	0.00006	0.23595	0.00013	-2.2808	0.0100	1.24329	0.01700	0.02480	0.00038	0.08246	0.00016
IR-14-149	2.4857	0.0035	0.51250	0.00011	0.34840	0.00009	0.24138	0.00007	0.23554	0.00033	-2.1270	0.0078	1.32652	0.02800	0.02697	0.00057	0.08425	0.00005
IR-14-150	2.5039	0.0090	0.51248	0.00003	0.34840	0.00003	0.24143	0.00006	0.23621	0.00009	-2.0970	0.0061	1.26407	0.02600	0.02576	0.00051	0.08458	0.00005
IR-14-151	2.5141	0.0045	0.51259	0.00006	0.34839	0.00003	0.24138	0.00007	0.23594	0.00017	-2.0894	0.0078	1.20634	0.01500	0.02431	0.00029	0.08349	0.00004
IR-14-152	2.5198	0.0045	0.51258	0.00004	0.34831	0.00004	0.24132	0.00007	0.23589	0.00013	-2.0180	0.0081	1.28179	0.02600	0.02564	0.00050	0.08306	0.00005
IR-14-153	2.4953	0.0063	0.51260	0.00005	0.34831	0.00003	0.24115	0.00006	0.23566	0.00023	-1.9688	0.0075	1.26163	0.03000	0.02567	0.00059	0.08445	0.00006
IR-14-154	2.5044	0.0033	0.51259	0.00005	0.34834	0.00003	0.24133	0.00005	0.23597	0.00012	-1.8666	0.0075	1.27841	0.02100	0.02572	0.00041	0.08362	0.00007
	2.52433	**0.00458**	**0.51260**	**0.00004**	**0.34833**	**0.00003**	**0.24130**	**0.00006**	**0.23593**	**0.00014**	**-2.1361**	**0.0078**	**1.37388**	**0.02338**	**0.02776**	**0.00048**	**0.08372**	**0.00007**
	0.03174	**0.00182**	**0.00008**	**0.00001**	**0.00006**	**0.00001**	**0.00010**	**0.00001**	**0.00017**	**0.00005**	**0.0976**	**0.0013**	**0.08433**	**0.00537**	**0.00177**	**0.00011**	**0.00077**	**0.00005**

Measurement Conditions:

	Goniometer=PW3050/60 (Theta/2Theta); Minimum step size 2Theta:0,001; Minimum step size Omega:0,001
	Sample stage=Spinner PW3064
	Diffractometer system=XPERT-PRO
	Measurement program=1_std_a12_4-80, Owner=User-1,
	Fine Calibration Offset for 2Theta = -0,030 deg
	std 30'
Operator	usuari
Raw Data Origin	XRD measurement (*.XRDML)
Scan Axis	Gonio
Start Position [°2Th.]	4.2083
End Position [°2Th.]	79.9943
Step Size [°2Th.]	0.0170
Scan Step Time [s]	51.2450
Scan Type	Continuous
PSD Mode	Scanning
PSD Length [°2Th.]	2.11
Offset [°2Th.]	0.0000
Divergence Slit Type	Automatic
Irradiated Length [mm]	10.00
Specimen Length [mm]	10.00
Measurement Temperature [°C]	25.00
Anode Material	Cu
K-Alpha1 [Å]	1.54060
K-Alpha2 [Å]	1.54443
K-Beta [Å]	1.39225
K-A2 / K-A1 Ratio	0.50000
Generator Settings	40 mA, 45 kV
Diffractometer Type	0000000085010818
Diffractometer Number	0
Goniometer Radius [mm]	240.00
Dist. Focus-Diverg. Slit [mm]	100.00
Incident Beam Monochromator	No
Spinning	Yes

CHAPTER 4.
PETROGRAPHY OF THE ANGOLAN KIMBERLITES

APPENDIX

A4.1. Major-element composition of groundmass phlogopite of the studied. Oxides in wt%

#Label	MGR-11_f_001	MGR-11_f_002	MGR-11_f_003	MGR-11_f_004	MGR-11_f_005	MGR-11_f_006	MGR-35_1_25	MGR-35_1_26	MGR-35_1_27
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Mineral	phl	phl	phl	phl	phl	phl	phl	phl	phl
Area	core	core	core	rim	rim	rim	core	core	rim
SiO_2	36.32	35.82	38.64	39.86	35.72	36.54	42.2	41.55	41.52
TiO_2	2.07	2.46	1.41	0.88	2.26	1.95	0.47	0.46	0.44
Al_2O_3	17.51	17.89	14.24	8.26	18.88	18.57	12.05	11.84	11.81
Cr_2O_3	0.11	0.13	0.07	0.06	0.11	0.12	0.03	0.05	0.06
FeO	16.72	17.71	14.58	10.31	17.17	16.97	6.28	6.44	6.52
V_2O_3	-	-	-	-	-	-	-	-	-
ZnO	-	-	-	-	-	-	-	-	-
MnO	0.15	0.15	0.09	0.09	0.22	0.18	0.01	0.03	0.05
MgO	12.55	11.65	18.83	26.77	11.28	12.13	24.95	24.54	24.87
CaO	0.04	0.06	0.09	0.63	0.06	0.07	0	0	0
Na_2O	0.42	0.28	0.39	0.33	0.6	0.39	0.13	0.12	0.11
K_2O	8.99	9.22	6.55	3.58	9.5	9.31	10.23	10.3	10.08
BaO	0	0.04	0.04	0	0.13	0.02	0.22	0	0.16
Rb_2O	-	-	-	-	-	-	-	-	-
Cs_2O	-	-	-	-	-	-	-	-	-
SrO	-	-	-	-	-	-	-	-	-
NiO	0.09	0	0.04	0.04	0.06	0.05	0.1	0.05	0.03
F	0.2	0.18	0.18	0	0.55	0.36	0.63	0	0.28
Cl	0.3	0.33	0.25	0.07	0.29	0.27	0.11	0.12	0.11
$H_2O_{(c)}$	3.81	3.8	3.93	4.01	3.66	3.79	3.92	4.15	4.03
O=F	0.08	0.07	0.07	0	0.23	0.15	0.27	0	0.12
O=Cl	0.07	0.07	0.06	0.02	0.07	0.06	0.02	0.03	0.02
Sum Ox%	99.13	99.57	99.2	94.88	100.2	100.52	101.04	99.64	99.94
Si	5.476	5.41	5.679	5.94	5.363	5.437	5.963	5.955	5.937
Ti	0.234	0.28	0.156	0.099	0.255	0.219	0.05	0.05	0.047
Al/Al^{IV}	2.524	2.59	2.321	1.45	2.637	2.563	2.006	2	1.991
Al^{VI}	0.588	0.595	0.145	0	0.704	0.694	0	0	0
Cr	0.014	0.015	0.008	0.008	0.014	0.014	0.003	0.006	0.007
Fe^{2+}	2.108	2.236	1.791	1.285	2.156	2.111	0.742	0.771	0.78
V	-	-	-	-	-	-	-	-	-
Zn	-	-	-	-	-	-	-	-	-
Mn^{2+}	0.019	0.019	0.012	0.011	0.028	0.023	0.001	0.004	0.006
Mg	2.82	2.623	4.125	5.945	2.526	2.69	5.254	5.241	5.302
Ca	0.007	0.01	0.014	0.101	0.01	0.011	0	0	0
Na	0.123	0.083	0.111	0.096	0.175	0.112	0.035	0.034	0.03
K	1.729	1.776	1.227	0.68	1.82	1.767	1.844	1.882	1.839
Ba	0	0.002	0.002	0	0.008	0.001	0.012	0	0.009
Rb	-	-	-	-	-	-	-	-	-
Cs	-	-	-	-	-	-	-	-	-
Sr	-	-	-	-	-	-	-	-	-
Ni	0.011	0.001	0.005	0.005	0.007	0.006	0.011	0.006	0.004
F	0.096	0.085	0.083	0	0.263	0.168	0.283	0	0.128
Cl	0.075	0.084	0.063	0.018	0.075	0.068	0.025	0.029	0.026
OH	3.829	3.831	3.854	3.981	3.662	3.764	3.692	3.971	3.847
Sum Cat#	19.653	19.64	19.597	19.62	19.702	19.649	19.922	19.95	19.951
XMg	0.572	0.54	0.697	0.822	0.539	0.56	0.876	0.872	0.872
Oct	5.794	5.769	6.243	7.352	5.689	5.757	6.062	6.078	6.145
Int	1.859	1.871	1.354	0.877	2.013	1.892	1.891	1.916	1.878

A4.1. Major-element composition of groundmass phlogopite of the studied. Oxides in wt%

#Label	MGR-35_1_28	MGR-35_2_30	MGR-35_2_31	MGR-35_2_32	MGR-35_2_33	MGR-35_2_34	MGR-35_2_35	MGR-20B_g_107	MGR-20B_g_108
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Mineral	phl	phl	phl	phl	phl	phl	phl	phl	phl
Area	core	core	core	core	rim	rim	rim	core	core
SiO_2	41.27	41.26	41.99	40.99	37.05	38.68	37.87	38.95	39.12
TiO_2	0.51	0.38	0.44	0.4	4.67	0.37	4.71	3.77	4.3
Al_2O_3	11.68	11.48	11.75	11.23	15.1	9.91	15.42	14.05	14.76
Cr_2O_3	0.05	0.05	0.09	0.07	0.94	0.09	0.92	1.52	1.41
FeO	6.22	6.53	6.42	6.29	5.37	9.18	5.46	4.73	5.2
V_2O_3	-	-	-	-	-	-	-	-	-
ZnO	-	-	-	-	-	-	-	-	-
MnO	0.08	0.05	0.04	0	0.04	0.07	0.03	0.01	0.1
MgO	24.13	23.85	24.78	24.34	20.08	25.65	20.84	21.9	21.15
CaO	0	0	0	0.01	0.03	0.07	0.02	0.05	0.02
Na_2O	0.06	0.14	0.03	0.09	0.28	0.08	0.34	0.21	0.32
K_2O	10.18	10	10.13	9.76	9.56	6.39	9.4	8.37	9.39
BaO	0	0.08	0	0	0.26	0.02	0.2	0.1	0.14
Rb_2O	-	-	-	-	-	-	-	-	-
Cs_2O	-	-	-	-	-	-	-	-	-
SrO	-	-	-	-	-	-	-	-	-
NiO	0.06	0.08	0.06	0.07	0.05	0.07	0.05	0.1	0.07
F	0.14	0.45	0.59	0	0.32	0.61	0.42	0.49	0.12
Cl	0.1	0.11	0.11	0.06	0.01	0.05	0.04	0.03	0.06
$H_2O_{(c)}$	4.04	3.88	3.9	4.08	3.93	3.67	3.97	3.92	4.15
O=F	0.06	0.19	0.25	0	0.13	0.26	0.18	0.21	0.05
O=Cl	0.02	0.02	0.03	0.01	0	0.01	0.01	0.01	0.01
Sum Ox%	98.44	98.12	100.06	97.39	97.54	94.64	99.51	97.98	100.25
Si	5.98	6.008	5.983	5.995	5.437	5.836	5.435	5.618	5.557
Ti	0.055	0.042	0.047	0.043	0.516	0.041	0.508	0.409	0.46
Al/Al^{IV}	1.994	1.969	1.973	1.935	2.563	1.763	2.565	2.382	2.443
Al^{VI}	0	0	0	0	0.049	0	0.044	0.005	0.028
Cr	0.006	0.006	0.01	0.008	0.109	0.011	0.105	0.173	0.159
Fe^{2+}	0.754	0.795	0.765	0.769	0.659	1.159	0.655	0.571	0.617
V	-	-	-	-	-	-	-	-	-
Zn	-	-	-	-	-	-	-	-	-
Mn^{2+}	0.01	0.006	0.005	0.001	0.005	0.009	0.004	0.001	0.012
Mg	5.21	5.175	5.263	5.305	4.391	5.769	4.457	4.709	4.477
Ca	0	0	0	0.002	0.004	0.011	0.003	0.008	0.004
Na	0.016	0.039	0.009	0.026	0.079	0.023	0.095	0.06	0.088
K	1.882	1.858	1.842	1.821	1.789	1.229	1.721	1.539	1.702
Ba	0	0.005	0	0	0.015	0.001	0.011	0.006	0.008
Rb	-	-	-	-	-	-	-	-	-
Cs	-	-	-	-	-	-	-	-	-
Sr	-	-	-	-	-	-	-	-	-
Ni	0.007	0.01	0.007	0.008	0.006	0.008	0.006	0.012	0.008
F	0.065	0.205	0.265	0	0.149	0.29	0.189	0.223	0.055
Cl	0.026	0.026	0.028	0.015	0.003	0.012	0.01	0.008	0.014
OH	3.909	3.769	3.707	3.985	3.848	3.698	3.801	3.769	3.931
Sum Cat#	19.914	19.912	19.904	19.914	19.621	19.861	19.608	19.492	19.563
XMg	0.874	0.867	0.873	0.873	0.869	0.833	0.872	0.892	0.879
Oct	6.043	6.033	6.097	6.135	5.734	6.998	5.778	5.88	5.762
Int	1.898	1.901	1.851	1.849	1.887	1.264	1.83	1.612	1.801

A4.1. Major-element composition of groundmass phlogopite of the studied. Oxides in wt%

#Label	MGR-20B_g_109	MGR-20B_g_110	MGR-20B_d_110	MGR-20B_d_111	MGR-20B_d_112	MGR-20B_x_113	MGR-20B_x_114	MGR-20B_x_115	MGR-20B_b_116
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Mineral	phl	phl	phl	phl	phl	phl	phl	phl	phl
Area	core	rim	core	core	rim	core	core	core	core
SiO_2	41.35	39.09	39.61	39.62	39.82	39.48	39.32	39.73	39.8
TiO_2	1.93	4.01	3.39	3.56	2.67	3.62	3.46	3.1	3.5
Al_2O_3	7.05	14.68	14.1	14.53	11.11	14.29	13.12	13.12	14.87
Cr_2O_3	0.64	1.36	1.26	1.49	1.09	1.51	1.37	1.46	1.2
FeO	3.73	5.06	4.47	4.98	4.95	4.98	4.65	4.99	4.94
V_2O_3	-	-	-	-	-	-	-	-	-
ZnO	-	-	-	-	-	-	-	-	-
MnO	0.07	0	0.02	0	0.02	0.02	0.03	0.04	0.02
MgO	31.79	22.07	22.57	22.18	25.26	22.46	23.5	24.18	23.02
CaO	0.05	0	0	0.02	0.01	0	0	0.01	0.01
Na_2O	0.19	0.42	0.3	0.39	0.21	0.36	0.25	0.29	0.28
K_2O	3.96	8.96	9.05	9.16	6.68	9.2	8.46	9.12	9.38
BaO	0.23	0.2	0.1	0.16	0.29	0.45	0.18	0.25	0.35
Rb_2O	-	-	-	-	-	-	-	-	-
Cs_2O	-	-	-	-	-	-	-	-	-
SrO	-	-	-	-	-	-	-	-	-
NiO	0.06	0.09	0.17	0.11	0.14	0.19	0.13	0.21	0.16
F	0.31	0.44	0.02	0.73	0	0.53	0.61	0.31	0.72
Cl	0.03	0.04	0.03	0.05	0.05	0.04	0.06	0.06	0.02
$H_2O_{(c)}$	4	4.01	4.19	3.89	4.11	3.98	3.88	4.08	3.95
O=F	0.13	0.18	0.01	0.31	0	0.22	0.25	0.13	0.3
O=Cl	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0
Sum Ox%	95.26	100.23	99.26	100.55	96.4	100.9	98.73	100.82	101.92
Si	5.973	5.543	5.645	5.599	5.798	5.579	5.639	5.614	5.557
Ti	0.209	0.428	0.364	0.379	0.292	0.384	0.373	0.329	0.368
Al/Al^{IV}	1.201	2.452	2.355	2.401	1.907	2.38	2.218	2.186	2.443
Al^{VI}	0	0	0.013	0.019	0	0	0	0	0.004
Cr	0.074	0.152	0.141	0.167	0.125	0.169	0.155	0.163	0.132
Fe^{2+}	0.451	0.6	0.533	0.589	0.602	0.589	0.557	0.59	0.577
V	-	-	-	-	-	-	-	-	-
Zn	-	-	-	-	-	-	-	-	-
Mn^{2+}	0.008	0	0.002	0	0.002	0.003	0.003	0.004	0.003
Mg	6.844	4.664	4.795	4.673	5.483	4.731	5.023	5.094	4.791
Ca	0.008	0	0	0.002	0.001	0	0	0.002	0.001
Na	0.054	0.116	0.083	0.108	0.059	0.098	0.07	0.081	0.075
K	0.729	1.62	1.645	1.651	1.241	1.659	1.548	1.643	1.671
Ba	0.013	0.011	0.005	0.009	0.017	0.025	0.01	0.014	0.019
Rb	-	-	-	-	-	-	-	-	-
Cs	-	-	-	-	-	-	-	-	-
Sr	-	-	-	-	-	-	-	-	-
Ni	0.007	0.01	0.019	0.013	0.016	0.022	0.014	0.024	0.018
F	0.14	0.197	0.011	0.325	0	0.238	0.275	0.14	0.32
Cl	0.006	0.009	0.008	0.011	0.013	0.009	0.014	0.014	0.004
OH	3.854	3.795	3.981	3.664	3.987	3.753	3.711	3.846	3.676
Sum Cat#	19.572	19.596	19.6	19.609	19.543	19.64	19.611	19.744	19.659
XMg	0.938	0.886	0.9	0.888	0.901	0.889	0.9	0.896	0.892
Oct	7.594	5.854	5.867	5.838	6.521	5.898	6.126	6.205	5.892
Int	0.804	1.748	1.733	1.77	1.317	1.782	1.628	1.74	1.766

A4.1. Major-element composition of groundmass phlogopite of the studied. Oxides in wt%

#Label	MGR-20B_b_117	MGR-20B_b_118	MGR-20B_b_119	MGR-20B_b_120	MGR-20B_b_121	MGR-20B_b_122	H1-8D_c_021	H1-8D_c_022	H2-5C_e_080
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Lucapa 1	Lucapa 1	Lucapa 2
Mineral	phl	phl	phl	phl	phl	phl	phl	phl	phl
Area	rim	core	core	core	fine rim	fine rim	core	core	core
SiO_2	40.54	38.65	40.42	40.29	37.85	38.94	37.4	42.04	36.92
TiO_2	3.46	3.57	3.54	3.52	8.94	6.94	2.94	0.88	2.73
Al_2O_3	14.68	14.24	12.72	12.43	10.87	11.66	14.33	4.83	13.32
Cr_2O_3	1.22	1.35	1.41	1.46	0.49	1.01	0.06	0.02	0.05
FeO	4.58	4.83	5.15	4.48	7.81	6.78	6.46	3.47	6.76
V_2O_3	-	-	-	-	-	-	-	-	-
ZnO	-	-	-	-	-	-	-	-	-
MnO	0.03	0.08	0.02	0.03	0.05	0	0.06	0.03	0.03
MgO	23.24	21.74	23.1	22.67	19.38	21.16	21.98	32.5	23.61
CaO	0.05	0.1	0.07	0.01	0.53	0.34	0.06	0.19	0.19
Na_2O	0.38	0.31	0.26	0.27	0.93	0.89	0.36	0.14	0.43
K_2O	9.04	9.08	8.7	8.42	6.98	7.35	9.75	2.41	6.33
BaO	0.16	0.33	0	0.2	0.96	0.41	0.49	0.07	0.22
Rb_2O	-	-	-	-	-	-	-	-	-
Cs_2O	-	-	-	-	-	-	-	-	-
SrO	-	-	-	-	-	-	-	-	-
NiO	0.16	0.16	0.16	0.17	0.05	0.09	-	-	-
F	0.39	0.19	0.1	0.71	1.22	1.56	0.28	0.02	0.26
Cl	0.03	0.05	0.07	0.06	0.02	0.06	-	-	-
$H_2O_{(c)}$	4.13	4.05	4.16	3.82	3.53	3.43	3.95	4	3.89
O=F	0.16	0.08	0.04	0.3	0.52	0.66	0.12	0.01	0.11
O=Cl	0.01	0.01	0.01	0.01	0	0.01	-	-	-
Sum Ox%	101.92	98.64	99.82	98.21	99.1	99.96	98	90.59	94.63
Si	5.625	5.579	5.735	5.793	5.523	5.58	5.497	6.281	5.519
Ti	0.361	0.388	0.378	0.38	0.981	0.748	0.325	0.099	0.307
Al/Al^{IV}	2.375	2.421	2.126	2.106	1.87	1.97	2.483	0.851	2.347
Al^{VI}	0.025	0.002	0	0	0	0	0	0	0
Cr	0.134	0.154	0.158	0.166	0.057	0.115	0.007	0.002	0.006
Fe^{2+}	0.531	0.583	0.611	0.539	0.953	0.813	0.795	0.434	0.845
V	-	-	-	-	-	-	-	-	-
Zn	-	-	-	-	-	-	-	-	-
Mn^{2+}	0.003	0.009	0.002	0.003	0.006	0	0.008	0.004	0.003
Mg	4.807	4.677	4.884	4.859	4.216	4.52	4.815	7.237	5.261
Ca	0.007	0.015	0.011	0.001	0.082	0.053	0.009	0.031	0.031
Na	0.103	0.087	0.071	0.076	0.264	0.247	0.102	0.04	0.124
K	1.6	1.673	1.575	1.544	1.3	1.344	1.829	0.459	1.208
Ba	0.009	0.019	0	0.011	0.055	0.023	0.028	0.004	0.013
Rb	-	-	-	-	-	-	-	-	-
Cs	-	-	-	-	-	-	-	-	-
Sr	-	-	-	-	-	-	-	-	-
Ni	0.017	0.019	0.018	0.02	0.006	0.011	-	-	-
F	0.171	0.089	0.044	0.321	0.564	0.706	0.13	0.011	0.124
Cl	0.008	0.011	0.016	0.015	0.004	0.015	-	-	-
OH	3.821	3.9	3.94	3.664	3.432	3.279	3.87	3.989	3.876
Sum Cat#	19.599	19.625	19.568	19.5	19.314	19.424	19.897	19.442	19.664
XMg	0.901	0.889	0.889	0.9	0.816	0.848	0.858	0.943	0.862
Oct	5.879	5.831	6.051	5.968	6.219	6.207	5.95	7.776	6.422
Int	1.72	1.793	1.657	1.633	1.702	1.667	1.967	0.534	1.376

A4.1. Major-element composition of groundmass phlogopite of the studied. Oxides in wt%

#Label	H2-7A_a	H2-7A_a
Kimberlite	Lucapa 2	Lucapa 2
Mineral	phl	phl
Area	core	core
SiO_2	35.73	35.41
TiO_2	3.71	3.75
Al_2O_3	16.38	16.81
Cr_2O_3	0.19	0.2
FeO	15.23	15.75
V_2O_3	-	-
ZnO	-	-
MnO	0.09	0.01
MgO	12.17	12.41
CaO	0.05	0.05
Na_2O	0.09	0.11
K_2O	9.19	9.51
BaO	0.27	0.35
Rb_2O	-	-
Cs_2O	-	-
SrO	-	-
NiO	-	-
F	0.39	0.3
Cl	-	-
$H_2O_{(c)}$	3.72	3.8
O=F	0.16	0.13
O=Cl	-	-
Sum Ox%	97.05	98.32
Si	5.486	5.393
Ti	0.428	0.429
Al/Al^{IV}	2.514	2.607
Al^{VI}	0.45	0.41
Cr	0.023	0.024
Fe^{2+}	1.955	2.006
V	-	-
Zn	-	-
Mn^{2+}	0.012	0.001
Mg	2.786	2.818
Ca	0.008	0.007
Na	0.028	0.032
K	1.8	1.848
Ba	0.016	0.021
Rb	-	-
Cs	-	-
Sr	-	-
Ni	-	-
F	0.19	0.144
Cl	-	-
OH	3.81	3.856
Sum Cat#	19.506	19.597
XMg	0.588	0.584
Oct	5.654	5.689
Int	1.853	1.908

A4.1. Major-element composition of groundmass chromite and its ulvöspinel rims in the studied kimberlites. Oxides in wt%. Structural formula normalised to 4 oxygens.

#Label	h1-8 cercle a-1	h1-8 cercle a-2	h1-8 cercle a-3	h1-8 cercle a-4	h1-8 cercle a-5	h1-8 cercle a-6	H1-8D_c_015	H1-8D_c_016	H1-8D_h_036
Kimberlite	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1
Mineral	chr	chr	chr	chr	chr	chr	chr	chr	chr
SiO_2	0.07	0.11	0.06	0.08	0.07	0.1	0.06	0.07	0.02
TiO_2	0.24	0.28	0.29	0.29	0.29	0.28	2.56	6.08	0.26
Al_2O_3	8.34	8.52	8.11	8.14	8.06	8.23	0.57	7.97	20.36
Cr_2O_3	57.83	56.57	57.73	56.45	57.09	55.96	45.84	36.3	47.48
Fe_2O_3	4.96	5.34	4.86	5.29	5.23	5.81	19.81	15.35	1.16
FeO	18.28	18.51	18.47	18.75	18.31	18.81	21.67	21.51	17.65
V_2O_3	0.23	0.16	0.15	0.13	0.17	0.13	0.19	0.07	0.13
MnO	0.39	0.38	0.34	0.33	0.42	0.3	0.22	0.31	0.26
MgO	9.81	9.59	9.61	9.25	9.57	9.29	7.73	10.61	10.96
ZnO	0	0	0	0	0	0	0.15	0.09	0.48
NiO	-	-	-	-	-	-	-	-	-
CoO	-	-	-	-	-	-	-	-	-
GeO_2	-	-	-	-	-	-	-	-	-
CuO	-	-	-	-	-	-	-	-	-
Sum Ox%	100.15	99.44	99.63	98.72	99.21	98.91	98.8	98.35	98.77
Si	0.002	0.004	0.002	0.003	0.002	0.003	0.002	0.002	0.001
Ti	0.006	0.007	0.007	0.007	0.007	0.007	0.069	0.155	0.006
Al/Al^{IV}	0	0	0	0	0	0	0	0	0
Al^{VI}	0.328	0.337	0.321	0.326	0.321	0.329	0.024	0.318	0.763
Cr	1.525	1.502	1.533	1.515	1.523	1.499	1.296	0.973	1.193
Fe^{3+}	0.124	0.135	0.123	0.135	0.133	0.148	0.533	0.392	0.028
Fe^{2+}	0.51	0.52	0.519	0.532	0.517	0.533	0.648	0.61	0.469
V	0.006	0.004	0.004	0.004	0.005	0.003	0.005	0.002	0.003
Mn^{2+}	0.011	0.011	0.01	0.01	0.012	0.009	0.007	0.009	0.007
Mg	0.487	0.48	0.481	0.468	0.481	0.469	0.412	0.536	0.519
Zn	0	0	0	0	0	0	0.004	0.002	0.011
Ni	-	-	-	-	-	-	-	-	-
Co	-	-	-	-	-	-	-	-	-
Ge	-	-	-	-	-	-	-	-	-
Cu	-	-	-	-	-	-	-	-	-
Sum Cat#	3	3	3	3	3	3	3	3	3
XCr	82.3	81.665	82.676	82.312	82.608	82.014	98.193	75.354	61.006
XFe^{2+}	51.126	51.99	51.893	53.211	51.768	53.169	61.119	53.212	47.462
YFe^{3+}	6.293	6.833	6.219	6.838	6.716	7.498	28.77	23.275	1.399

A4.1. Major-element composition of groundmass chromite and its ulvöspinel rims in the studied kimberlites. Oxides in wt%. Structural formula normalised to 4 oxygens.

#Label	H1-8D_h_037	H1-8D_k_043	H1-4a_a_041	H1-4a_a_042	H1-4a_a_044	H1-4a_a_045	H1-4a_a_046	H1-4a_b_047	H1-4a_b_048
Kimberlite	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1
Mineral	chr	chr	usp	usp	usp	usp	usp	usp	usp
SiO_2	0.05	0.13	0.13	2.32	0.15	0.09	0.13	0.13	0.12
TiO_2	0.33	3.23	18.17	1.87	17.45	17.9	17.99	18.01	17.15
Al_2O_3	19.74	10.43	3.39	0	3.42	3.49	3.84	3.72	4.69
Cr_2O_3	48.4	45.39	0.27	0.06	0.3	0.48	0.73	0.28	0.39
Fe_2O_3	0.75	9.24	31.31	56.21	32.95	32.8	31.54	31.46	32.64
FeO	18.48	19.33	34.87	33.14	32.36	33.33	33.53	34.08	31.26
V_2O_3	0.24	0.1	0.09	0	0.03	0.03	0.05	0.01	0
MnO	0.3	0.25	0.64	0.26	0.92	0.6	0.62	0.51	0.63
MgO	10.59	10.91	7.85	0.4	8.78	8.87	8.75	8.4	9.7
ZnO	0.33	0.12	0.14	0.03	0.14	0.04	0.13	0.03	0.14
NiO	-	-	0.01	0.06	0.07	0.1	0.05	0.03	0.01
CoO	-	-	-	-	-	-	-	-	-
GeO_2	-	-	-	-	-	-	-	-	-
CuO	-	-	-	-	-	-	-	-	-
Sum Ox%	99.2	99.12	96.88	94.36	96.57	97.73	97.36	96.66	96.73
Si	0.001	0.004	0.005	0.093	0.006	0.003	0.005	0.005	0.004
Ti	0.008	0.08	0.493	0.056	0.472	0.478	0.481	0.487	0.457
Al/Al^{IV}	0	0	0	0	0	0	0	0	0
Al^{VI}	0.74	0.408	0.144	0	0.145	0.146	0.161	0.158	0.196
Cr	1.217	1.19	0.008	0.002	0.009	0.014	0.021	0.008	0.011
Fe^{3+}	0.018	0.231	0.85	1.699	0.891	0.877	0.845	0.851	0.87
Fe^{2+}	0.492	0.536	1.052	1.113	0.973	0.99	0.998	1.024	0.926
V	0.006	0.003	0.003	0	0.001	0.001	0.001	0	0
Mn^{2+}	0.008	0.007	0.02	0.009	0.028	0.018	0.019	0.015	0.019
Mg	0.502	0.539	0.422	0.024	0.471	0.47	0.464	0.45	0.512
Zn	0.008	0.003	0.004	0.001	0.004	0.001	0.003	0.001	0.004
Ni	-	-	0	0.002	0.002	0.003	0.001	0.001	0
Co	-	-	-	-	-	-	-	-	-
Ge	-	-	-	-	-	-	-	-	-
Cu	-	-	-	-	-	-	-	-	-
Sum Cat#	3	3	3	3	3	3	3	3	3
XCr	62.196	74.485	4.996	99.882	5.544	8.493	11.349	4.867	5.274
XFe^{2+}	49.473	49.858	71.354	97.873	67.401	67.829	68.25	69.472	64.397
YFe^{3+}	0.909	12.615	84.852	99.892	85.321	84.609	82.311	83.703	80.81

A4.1. Major-element composition of groundmass chromite and its ulvöspinel rims in the studied kimberlites. Oxides in wt%. Structural formula normalised to 4 oxygens.

#Label	H1-4a_b_052	H1-4a_c_056	H1-4a_d_059	H1-4a_d_063	H1-4b_c_100	H1-4b_c_101	H1-4b_c_104	H1-4b_d_109	H1-4b_d_110
Kimberlite	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1
Mineral	usp	usp	usp	usp	usp	usp	usp	usp	usp
SiO_2	2.77	2.56	0.13	2.93	0.2	0.44	2.92	0.11	0.09
TiO_2	4.02	7.13	22.6	7.48	1.66	1.72	12.16	18.2	18.33
Al_2O_3	0	0.5	3.98	0	0	0	0.05	3.59	3.07
Cr_2O_3	0.03	0.31	1.08	0.18	0.03	0.07	0.06	0.38	0.13
Fe_2O_3	49.5	43.09	22.62	40.87	64.03	62.69	30.03	31.17	32.33
FeO	35.11	36.36	36.96	37.55	30.11	30.16	40.45	35.07	34.88
V_2O_3	0.05	0.03	0	0	0	0.08	0	0	0
MnO	0.23	0.48	0.53	0.47	0.26	0.26	0.25	0.6	0.53
MgO	0.44	1.1	9.43	0.45	1	1.06	0.89	7.83	8.05
ZnO	0.05	0.04	0.01	0.07	0.07	0.06	0.07	0.01	0.17
NiO	0	0	0.13	0.05	0.07	0.05	0.07	0.09	0.04
CoO	-	-	-	-	-	-	-	-	-
GeO_2	-	-	-	-	-	-	-	-	-
CuO	-	-	-	-	-	-	-	-	-
Sum Ox%	92.22	91.61	97.47	90.05	97.43	96.59	86.95	97.04	97.6
Si	0.113	0.104	0.005	0.122	0.008	0.017	0.125	0.004	0.003
Ti	0.124	0.218	0.598	0.234	0.049	0.051	0.39	0.492	0.494
Al/Al^{IV}	0	0	0	0	0	0	0	0	0
Al^{VI}	0	0.024	0.165	0	0	0	0.003	0.152	0.13
Cr	0.001	0.01	0.03	0.006	0.001	0.002	0.002	0.011	0.004
Fe^{3+}	1.523	1.32	0.599	1.281	1.886	1.859	0.965	0.844	0.872
Fe^{2+}	1.2	1.238	1.088	1.308	0.986	0.994	1.445	1.055	1.046
V	0.002	0.001	0	0	0	0.002	0	0	0
Mn^{2+}	0.008	0.017	0.016	0.016	0.008	0.009	0.009	0.018	0.016
Mg	0.027	0.067	0.495	0.028	0.058	0.062	0.056	0.42	0.43
Zn	0.001	0.001	0	0.002	0.002	0.002	0.002	0	0.004
Ni	0	0	0.004	0.002	0.002	0.002	0.002	0.003	0.001
Co	-	-	-	-	-	-	-	-	-
Ge	-	-	-	-	-	-	-	-	-
Cu	-	-	-	-	-	-	-	-	-
Sum Cat#	3	3	3	3	3	3	3	3	3
XCr	99.793	29.834	15.399	99.963	99.755	99.895	43.936	6.648	2.743
XFe^{2+}	97.794	94.863	68.751	97.894	94.436	94.092	96.245	71.523	70.861
YFe^{3+}	99.931	97.499	75.43	99.534	99.954	99.89	99.516	83.81	86.749

A4.1. Major-element composition of groundmass chromite and its ulvöspinel rims in the studied kimberlites. Oxides in wt%. Structural formula normalised to 4 oxygens.

#Label	H1-4b_d_112	H1-4b_d_115	H2-7A_c	H2-7A_e	H2-7A_e	H2-5C_c_072	H2-5C_c_073	H2-5C_f_084b	H2-5d_b_093b
Kimberlite	Lucapa 1	Lucapa 1	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2
Mineral	usp	usp	chr	chr	chr	chr	chr	chr	chr
SiO_2	2.77	1.4	0.17	0.13	0.13	0.17	0.2	0.16	0.14
TiO_2	4.95	16.16	4.16	4.36	4.27	4.25	4.13	5.36	6.72
Al_2O_3	0.02	2.06	8.49	8.11	9.27	8.96	9.27	7.71	7.41
Cr_2O_3	0.03	0.63	40.88	40.47	42.72	41.33	41.8	38.52	35.57
Fe_2O_3	46.89	28.55	13.43	15.15	10.44	11.86	10.74	13.85	15.7
FeO	35.35	40.39	20.74	20.93	21.75	21.87	21.47	22.41	23.49
V_2O_3	0.09	0	0.1	0.04	0.1	0.17	0.14	0.07	0.15
MnO	0.19	1.34	0.37	0.36	0.33	0.31	0.3	0.31	0.35
MgO	0.63	2.81	10.13	10.34	9.73	9.56	9.64	9.63	9.89
ZnO	0.01	0.16	0.12	0.12	0.04	0.13	0.15	0.06	0.15
NiO	0.02	0.12	-	-	-	-	-	-	-
CoO	-	-	-	-	-	-	-	-	-
GeO_2	-	-	-	-	-	-	-	-	-
CuO	-	-	-	-	-	-	-	-	-
Sum Ox%	90.94	93.61	98.59	99.99	98.76	98.61	97.83	98.07	99.56
Si	0.115	0.054	0.006	0.004	0.004	0.006	0.007	0.005	0.005
Ti	0.154	0.472	0.106	0.11	0.108	0.108	0.106	0.138	0.171
Al/Al^{IV}	0	0	0	0	0	0	0	0	0
Al^{VI}	0.001	0.094	0.339	0.32	0.368	0.358	0.372	0.311	0.295
Cr	0.001	0.019	1.094	1.07	1.139	1.107	1.125	1.043	0.95
Fe^{3+}	1.458	0.834	0.342	0.381	0.265	0.302	0.275	0.357	0.399
Fe^{2+}	1.222	1.311	0.587	0.586	0.613	0.62	0.611	0.642	0.664
V	0.003	0	0.003	0.001	0.003	0.004	0.004	0.002	0.004
Mn^{2+}	0.007	0.044	0.011	0.01	0.009	0.009	0.009	0.009	0.01
Mg	0.039	0.163	0.511	0.515	0.489	0.483	0.489	0.491	0.498
Zn	0	0.005	0.003	0.003	0.001	0.003	0.004	0.001	0.004
Ni	0.001	0.004	-	-	-	-	-	-	-
Co	-	-	-	-	-	-	-	-	-
Ge	-	-	-	-	-	-	-	-	-
Cu	-	-	-	-	-	-	-	-	-
Sum Cat#	3	3	3	3	3	3	3	3	3
XCr	47.264	16.914	76.357	77.006	75.557	75.566	75.166	77.016	76.311
XFe^{2+}	96.943	88.963	53.457	53.188	55.635	56.214	55.544	56.635	57.133
YFe^{3+}	99.849	88.021	19.27	21.533	14.951	17.113	15.524	20.854	24.282

A4.1. Major-element composition of groundmass chromite and its ulvöspinel rims in the studied kimberlites. Oxides in wt%. Structural formula normalised to 4 oxygens.

#Label	H2-5d_e_105	H2-7d_a_001	H2-7d_a_002	H2-7d_a_003	H2-7d_a_004	H2-7d_a_005	H2-7d_a_006	H2-7d_a_007	H2-7d_a_008
Kimberlite	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2
Mineral	chr	chr	chr	usp	usp	chr	chr	chr	usp
SiO_2	0.12	0.12	0.1	0.14	1.87	0.05	0.06	0.07	0.12
TiO_2	5.15	5.06	6.43	12.82	9.56	2.96	3.16	5.6	10.56
Al_2O_3	8.17	9.17	7.52	0.31	0.59	6.12	6.2	8.05	0.4
Cr_2O_3	40.22	40.79	35.36	0.09	0.14	44.44	44.39	37.99	0.26
Fe_2O_3	12.74	12.68	16.75	43.19	45.69	14.91	15.11	15.06	47.25
FeO	21.9	22.31	23.14	33.11	31.9	22.54	22.49	23.1	31.62
V_2O_3	0.09	0.16	0.13	0	0	0.22	0.22	0.12	0
MnO	0.39	0.39	0.43	0.85	0.99	0.34	0.32	0.39	1.07
MgO	9.93	10.04	9.91	4.97	5.45	8.02	8.34	9.5	4.62
ZnO	0.12	0.12	0.05	0.13	0.11	0.22	0.19	0.2	0
NiO	-	0.21	0.15	0.14	0	0.21	0.24	0.1	0
CoO	-	-	-	-	-	-	-	-	-
GeO_2	-	-	-	-	-	-	-	-	-
CuO	-	-	-	-	-	-	-	-	-
Sum Ox%	98.82	101.05	99.95	95.76	96.31	100.05	100.72	100.18	95.89
Si	0.004	0.004	0.003	0.005	0.07	0.002	0.002	0.002	0.005
Ti	0.131	0.126	0.163	0.367	0.27	0.076	0.081	0.142	0.303
Al/Al^{IV}	0	0	0	0	0	0	0	0	0
Al^{VI}	0.326	0.357	0.298	0.014	0.026	0.247	0.248	0.319	0.018
Cr	1.077	1.065	0.942	0.003	0.004	1.205	1.193	1.009	0.008
Fe^{3+}	0.325	0.315	0.424	1.238	1.29	0.385	0.387	0.381	1.358
Fe^{2+}	0.62	0.616	0.652	1.055	1.001	0.647	0.64	0.649	1.01
V	0.003	0.004	0.003	0	0	0.006	0.006	0.003	0
Mn^{2+}	0.011	0.011	0.012	0.027	0.031	0.01	0.009	0.011	0.035
Mg	0.501	0.494	0.497	0.282	0.304	0.41	0.423	0.476	0.263
Zn	0.003	0.003	0.001	0.004	0.003	0.006	0.005	0.005	0
Ni	-	0.006	0.004	0.004	0	0.006	0.007	0.003	0
Co	-	-	-	-	-	-	-	-	-
Ge	-	-	-	-	-	-	-	-	-
Cu	-	-	-	-	-	-	-	-	-
Sum Cat#	3	3	3	3	3	3	3	3	3
XCr	76.753	74.894	75.943	15.965	13.695	82.966	82.772	76.006	30.554
XFe^{2+}	55.296	55.491	56.723	78.878	76.676	61.185	60.195	57.719	79.343
YFe^{3+}	18.794	18.14	25.504	98.667	97.695	20.946	21.143	22.283	98.135

A4.1. Major-element composition of groundmass chromite and its ulvöspinel rims in the studied kimberlites. Oxides in wt%. Structural formula normalised to 4 oxygens.

#Label	H2-7d_b_010	H2-7d_b_011	H2-7d_b_012	H2-7d_b_013	H2-7d_b_014	H2-7d_b_015	H2-7d_b_016	H2-7d_c_017	H2-7d_c_018
Kimberlite	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2
Mineral	chr	chr	usp	usp	usp	usp	usp	chr	usp
SiO_2	0.16	0.11	0.18	0.2	0.1	0.1	0.13	0.16	0.14
TiO_2	3.84	4.49	14.31	9.21	8.43	12.66	9.73	4.24	7.25
Al_2O_3	8.92	8.8	6.16	1.33	7.29	5.79	1.21	9.18	7.65
Cr_2O_3	45.27	42.71	10.97	0.28	29.52	14.02	0.19	43.7	32.71
Fe_2O_3	9.98	11.73	27.22	50.02	19.59	29.35	48.72	10.18	17.66
FeO	22.17	22.6	30.72	29.48	25	27.08	30.58	22.25	24.15
V_2O_3	0.13	0.11	0.05	0	0.09	0	0	0.24	0.12
MnO	0.26	0.44	0.47	0.82	0.36	0.43	0.82	0.29	0.38
MgO	9.4	9.41	9.36	5.7	9.99	10.79	5.12	9.59	9.82
ZnO	0.19	0.14	0.02	0.05	0.11	0.1	0.05	0.03	0.04
NiO	0.17	0.11	0.08	0.08	0.08	0.09	0.09	0.15	0.17
CoO	-	-	-	-	-	-	-	-	-
GeO_2	-	-	-	-	-	-	-	-	-
CuO	-	-	-	-	-	-	-	-	-
Sum Ox%	100.5	100.65	99.52	97.17	100.56	100.42	96.64	100.02	100.09
Si	0.005	0.004	0.006	0.007	0.003	0.004	0.005	0.005	0.005
Ti	0.096	0.113	0.369	0.258	0.213	0.321	0.275	0.106	0.183
Al/Al^{IV}	0	0	0	0	0	0	0	0	0
Al^{VI}	0.35	0.346	0.249	0.059	0.288	0.23	0.054	0.361	0.303
Cr	1.193	1.125	0.297	0.008	0.783	0.374	0.006	1.153	0.87
Fe^{3+}	0.25	0.294	0.702	1.403	0.495	0.746	1.38	0.256	0.447
Fe^{2+}	0.618	0.63	0.881	0.919	0.701	0.764	0.963	0.621	0.68
V	0.004	0.003	0.001	0	0.002	0	0	0.007	0.003
Mn^{2+}	0.007	0.012	0.014	0.026	0.01	0.012	0.026	0.008	0.011
Mg	0.467	0.468	0.478	0.317	0.5	0.543	0.287	0.477	0.492
Zn	0.005	0.003	0	0.001	0.003	0.003	0.001	0.001	0.001
Ni	0.005	0.003	0.002	0.002	0.002	0.002	0.003	0.004	0.004
Co	-	-	-	-	-	-	-	-	-
Ge	-	-	-	-	-	-	-	-	-
Cu	-	-	-	-	-	-	-	-	-
Sum Cat#	3	3	3	3	3	3	3	3	3
XCr	77.289	76.495	54.427	12.307	73.098	61.893	9.462	76.158	74.14
XFe^{2+}	56.945	57.392	64.812	74.378	58.404	58.462	77.012	56.56	57.99
YFe^{3+}	13.949	16.668	56.241	95.454	31.589	55.223	95.881	14.449	27.592

A4.1. Major-element composition of groundmass chromite and its ulvöspinel rims in the studied kimberlites. Oxides in wt%. Structural formula normalised to 4 oxygens.

#Label	H2-7d_c_020	H2-7d_c_021	H2-7d_c_022	H2-7d_c_023	H2-7d_d_027	H2-7d_d_028	H2-7d_d_029	H2-7d_d_030	H2-7d_d_031
Kimberlite	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2
Mineral	usp	chr	usp	chr	usp	usp	usp	usp	usp
SiO_2	0.12	0.08	0.1	0.15	0.06	0.37	0.11	0.21	0.16
TiO_2	7.73	5.31	10.08	5.04	6.03	40.64	11.35	7.35	15.81
Al_2O_3	5.57	7.96	6.42	8.29	0.14	0.07	5.91	6.97	0.65
Cr_2O_3	33.81	40.6	21.99	38.75	0.3	0.16	17.15	28.95	1.21
Fe_2O_3	17.27	13.04	25.08	13.32	53.57	0	29.04	22	36.35
FeO	24.3	22.5	26.23	22.42	35.25	46.87	24.25	22.03	35.43
V_2O_3	0.09	0.14	0.03	0.14	0.55	0	0.02	0.03	0
MnO	0.47	0.35	0.42	0.39	0.2	1.66	0.46	0.5	0.92
MgO	9.54	9.79	9.93	9.35	0.06	0.13	11.82	10.97	5.44
ZnO	0.07	0.09	0.1	0.09	0.03	0.03	0.16	0.14	0.04
NiO	0.06	0.12	0.15	0.07	0.02	0.07	0.11	0.02	0.1
CoO	-	-	-	-	-	-	-	-	-
GeO_2	-	-	-	-	-	-	-	-	-
CuO	-	-	-	-	-	-	-	-	-
Sum Ox%	99.03	100	100.54	97.99	96.22	90	100.37	99.18	96.12
Si	0.004	0.003	0.003	0.005	0.002	0.014	0.004	0.007	0.006
Ti	0.2	0.134	0.256	0.13	0.18	1.186	0.286	0.187	0.447
Al/Al^{IV}	0	0	0	0	0	0	0	0	0
Al^{VI}	0.226	0.315	0.256	0.335	0.006	0.003	0.233	0.278	0.029
Cr	0.918	1.078	0.587	1.049	0.009	0.005	0.454	0.774	0.036
Fe^{3+}	0.446	0.329	0.637	0.343	1.601	0	0.732	0.56	1.029
Fe^{2+}	0.698	0.632	0.741	0.642	1.171	1.522	0.68	0.623	1.115
V	0.002	0.004	0.001	0.004	0.017	0	0.001	0.001	0
Mn^{2+}	0.014	0.01	0.012	0.011	0.007	0.055	0.013	0.014	0.029
Mg	0.489	0.49	0.5	0.477	0.003	0.008	0.59	0.553	0.305
Zn	0.002	0.002	0.002	0.002	0.001	0.001	0.004	0.004	0.001
Ni	0.002	0.003	0.004	0.002	0.001	0.002	0.003	0.001	0.003
Co	-	-	-	-	-	-	-	-	-
Ge	-	-	-	-	-	-	-	-	-
Cu	-	-	-	-	-	-	-	-	-
Sum Cat#	3	3	3	3	3	2.795	3	3	3
XCr	80.27	77.377	69.683	75.824	59.598	61.099	66.057	73.598	55.379
XFe^{2+}	58.818	56.329	59.698	57.363	99.717	99.509	53.51	52.979	78.513
YFe^{3+}	28.066	19.131	43.061	19.876	99.016	0	51.574	34.734	94.069

A4.1. Major-element composition of groundmass chromite and its ulvöspinel rims in the studied kimberlites. Oxides in wt%. Structural formula normalised to 4 oxygens.

#Label	H2-6_a_067	H2-6_a_068	H2-6_a_069	H2-6_a_070	H2-6_a_071	H2-6_b_072	H2-6_b_073	H2-6_b_074	H2-6_b_075
Kimberlite	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2
Mineral	chr	usp	usp	usp	usp	usp	usp	usp	usp
SiO_2	0.12	0.13	0.2	0.84	0.33	0.18	0.32	0.08	0.05
TiO_2	4.05	18.45	16.44	7.89	17.63	18.72	15.86	18.78	7.51
Al_2O_3	8.17	4.64	5.24	7.39	4.5	4.51	3.53	4.72	8.01
Cr_2O_3	47.81	0.08	4.87	28.69	0.12	0.32	0.08	0.16	30.72
Fe_2O_3	8.35	32.85	31.03	18.01	31.73	30.11	35.75	31.13	19.66
FeO	21.17	30.67	29.81	25.49	31.96	32.06	31.81	32.25	23.31
V_2O_3	0.13	0	0	0.09	0	0	0	0	0.06
MnO	0.31	0.62	0.53	0.35	0.53	0.58	0.7	0.55	0.44
MgO	10.11	11.33	10.88	9.6	9.7	10.18	8.5	10.38	10.49
ZnO	0.06	0.05	0.11	0	0.13	0.05	0.17	0	0.1
NiO	0.19	0.07	0.16	0.15	0.12	0.15	0.09	0.07	0.13
CoO	-	-	-	-	-	-	-	-	-
GeO_2	-	-	-	-	-	-	-	-	-
CuO	-	-	-	-	-	-	-	-	-
Sum Ox%	100.47	98.88	99.25	98.5	96.76	96.85	96.82	98.12	100.48
Si	0.004	0.005	0.007	0.029	0.012	0.006	0.011	0.003	0.002
Ti	0.101	0.476	0.423	0.203	0.47	0.496	0.429	0.491	0.188
Al/Al^{IV}	0	0	0	0	0	0	0	0	0
Al^{VI}	0.32	0.188	0.211	0.297	0.188	0.187	0.15	0.194	0.315
Cr	1.257	0.002	0.132	0.775	0.003	0.009	0.002	0.004	0.81
Fe^{3+}	0.209	0.849	0.799	0.463	0.846	0.799	0.967	0.814	0.493
Fe^{2+}	0.589	0.88	0.853	0.728	0.947	0.945	0.956	0.938	0.65
V	0.003	0	0	0.002	0	0	0	0	0.001
Mn^{2+}	0.009	0.018	0.015	0.01	0.016	0.017	0.021	0.016	0.012
Mg	0.501	0.579	0.554	0.489	0.512	0.535	0.455	0.538	0.521
Zn	0.002	0.001	0.003	0	0.003	0.001	0.005	0	0.003
Ni	0.005	0.002	0.004	0.004	0.003	0.004	0.003	0.002	0.004
Co	-	-	-	-	-	-	-	-	-
Ge	-	-	-	-	-	-	-	-	-
Cu	-	-	-	-	-	-	-	-	-
Sum Cat#	3	3	3	3	3	3	3	3	3
XCr	79.705	1.139	38.41	72.263	1.807	4.555	1.542	2.249	72.012
XFe^{2+}	54.012	60.304	60.598	59.828	64.901	63.85	67.743	63.559	55.505
YFe^{3+}	11.696	81.721	69.976	30.159	81.539	80.28	86.415	80.443	30.491

A4.1. Major-element composition of groundmass chromite and its ulvöspinel rims in the studied kimberlites. Oxides in wt%. Structural formula normalised to 4 oxygens.

#Label	H2-6_b_076	H2-6_d_077	H2-6_d_078	H2-6_d_079	H2-6_d_080	H2-6_f_085	H2-6_f_086	H2-6_f_087	H2-6_f_088
Kimberlite	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2
Mineral	usp	usp	usp	usp	usp	chr	chr	usp	chr
SiO_2	0.13	0.26	0.22	0.08	0.04	0.08	0.1	15.24	0.15
TiO_2	18.07	0.33	0.38	11.54	11.03	5.16	5.94	4.5	3.14
Al_2O_3	4.69	0.38	0.39	2.79	2.56	7.9	7.92	3.15	8.09
Cr_2O_3	0.1	0.18	0.22	0.06	0.05	40.9	37.34	0.47	49.76
Fe_2O_3	31.97	65.1	65.33	45.6	46.35	14.21	15.88	14.19	8.38
FeO	32.03	30.07	30.25	29.22	30.13	20.87	21.74	18.05	19.96
V_2O_3	0	0.39	0.35	0	0.04	0.07	0	0.02	0.12
MnO	0.63	0.05	0.03	0.8	0.81	0.38	0.35	0.34	0.4
MgO	9.94	0.45	0.43	7.5	6.52	10.83	10.67	19.5	10.35
ZnO	0.14	0.05	0.06	0.06	0.06	0.11	0.16	0.14	0.07
NiO	0.05	0.09	0.06	0	0.04	0.14	0.04	0.09	0.19
CoO	-	-	-	-	-	-	-	-	-
GeO_2	-	-	-	-	-	-	-	-	-
CuO	-	-	-	-	-	-	-	-	-
Sum Ox%	97.75	97.36	97.72	97.65	97.63	100.65	100.14	75.68	100.63
Si	0.005	0.01	0.008	0.003	0.002	0.003	0.003	0.586	0.005
Ti	0.476	0.01	0.011	0.315	0.304	0.129	0.149	0.13	0.078
Al/Al^{IV}	0	0	0	0	0	0	0	0	0
Al^{VI}	0.194	0.018	0.018	0.119	0.11	0.309	0.311	0.143	0.316
Cr	0.003	0.006	0.007	0.002	0.001	1.072	0.985	0.014	1.305
Fe^{3+}	0.842	1.924	1.925	1.244	1.276	0.355	0.399	0.411	0.209
Fe^{2+}	0.938	0.988	0.99	0.886	0.922	0.579	0.607	0.58	0.553
V	0	0.012	0.011	0	0.001	0.002	0	0.001	0.003
Mn^{2+}	0.019	0.002	0.001	0.025	0.025	0.011	0.01	0.011	0.011
Mg	0.519	0.026	0.025	0.405	0.355	0.535	0.531	1.117	0.512
Zn	0.004	0.001	0.002	0.002	0.002	0.003	0.004	0.004	0.002
Ni	0.001	0.003	0.002	0	0.001	0.004	0.001	0.003	0.005
Co	-	-	-	-	-	-	-	-	-
Ge	-	-	-	-	-	-	-	-	-
Cu	-	-	-	-	-	-	-	-	-
Sum Cat#	3	3	3	3	3	3	3	3	3
XCr	1.379	24.194	27.561	1.363	1.172	77.636	75.985	9.091	80.484
XFe^{2+}	64.393	97.416	97.548	68.624	72.173	51.965	53.343	34.187	51.961
YFe^{3+}	81.093	98.799	98.71	91.13	91.954	20.43	23.524	72.347	11.423

A4.1. Major-element composition of groundmass chromite and its ulvöspinel rims in the studied kimberlites. Oxides in wt%. Structural formula normalised to 4 oxygens.

#Label	H2-6_f_089	H2-6_f_090	H2-6_f_091	H2-6_g_092	H2-6_g_093	H2-6_g_095	H2-9B_c_129	H2-9B_d_132	H2-9B_d_133
Kimberlite	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2
Mineral	chr	chr	chr	chr	chr	usp	usp	usp	usp
SiO_2	0.39	0.09	0.2	0.08	0.08	3.57	3.69	0.23	0.17
TiO_2	3.12	4.59	4.88	3.38	4.14	4.2	1.55	19.06	19.48
Al_2O_3	8	7.58	7.7	8.2	7.22	0.11	0.08	3.84	3.67
Cr_2O_3	49.28	43.2	42.48	48.57	45.17	0.16	0.11	0.8	0.16
Fe_2O_3	8.16	12.68	11.33	8.34	11.56	41.73	52.98	25.72	27.16
FeO	19.53	20.44	22.58	20.29	20.44	31.36	33.84	35.07	34.52
V_2O_3	0.19	0.07	0.06	0.14	0.11	0.19	0.01	0	0.06
MnO	0.32	0.39	0.3	0.25	0.33	0.23	0.21	0.89	1
MgO	10.77	10.68	9.43	10.08	10.27	1.92	0.8	7.51	8.19
ZnO	0.04	0.02	0.1	0.09	0.19	0.11	0.06	0.02	0.14
NiO	0.14	0.09	0.11	0.23	0.07	0	0.06	0.11	0.1
CoO	-	-	-	-	-	-	-	-	-
GeO_2	-	-	-	-	-	-	-	-	-
CuO	-	-	-	-	-	-	-	-	-
Sum Ox%	99.95	99.85	99.16	99.66	99.57	83.57	93.38	93.25	94.65
Si	0.013	0.003	0.007	0.003	0.003	0.158	0.148	0.009	0.006
Ti	0.078	0.115	0.125	0.085	0.105	0.139	0.047	0.534	0.537
Al/Al^{IV}	0	0	0	0	0	0	0	0	0
Al^{VI}	0.313	0.299	0.308	0.324	0.287	0.006	0.004	0.169	0.158
Cr	1.295	1.143	1.139	1.287	1.203	0.006	0.004	0.024	0.005
Fe^{3+}	0.204	0.319	0.289	0.21	0.293	1.387	1.602	0.722	0.749
Fe^{2+}	0.543	0.572	0.64	0.569	0.576	1.159	1.137	1.094	1.058
V	0.005	0.002	0.002	0.004	0.003	0.007	0	0	0.002
Mn^{2+}	0.009	0.011	0.009	0.007	0.01	0.008	0.007	0.028	0.031
Mg	0.534	0.533	0.477	0.504	0.516	0.126	0.048	0.418	0.448
Zn	0.001	0	0.002	0.002	0.005	0.004	0.002	0.001	0.004
Ni	0.004	0.003	0.003	0.006	0.002	0	0.002	0.003	0.003
Co	-	-	-	-	-	-	-	-	-
Ge	-	-	-	-	-	-	-	-	-
Cu	-	-	-	-	-	-	-	-	-
Sum Cat#	3	3	3	3	3	3	3	3	3
XCr	80.522	79.257	78.733	79.887	80.757	49.007	48.867	12.308	2.903
XFe^{2+}	50.42	51.783	57.333	53.031	52.758	90.178	95.964	72.368	70.272
YFe^{3+}	11.259	18.124	16.653	11.552	16.441	99.184	99.541	78.947	82.122

A4.1. Major-element composition of groundmass chromite and its ulvöspinel rims in the studied kimberlites. Oxides in wt%. Structural formula normalised to 4 oxygens.

#Label	H2-9B_e_134	H2-9B_e_135	H2-9B_e_136	H2-9B_e_137	H2-9B_e_138	H2-9B_g_143	H2-9B_g_144
Kimberlite	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2
Mineral	usp	usp	usp	usp	usp	usp	usp
SiO_2	1.39	0.76	0.49	0.11	0.44	0.32	0.4
TiO_2	15.98	20.22	21.47	19.75	19.28	19.61	19.28
Al_2O_3	0.57	3.61	3.42	4	4.01	3.78	3.96
Cr_2O_3	0.11	0.39	0.9	0.23	0.37	0.18	0.22
Fe_2O_3	31.88	25.22	24.59	26.36	27.7	27.03	26.84
FeO	40.06	36.03	37.3	34.87	35.73	34.39	33.97
V_2O_3	0.31	0	0	0.04	0.08	0	0
MnO	1.58	0.64	0.58	0.78	0.6	0.77	0.75
MgO	2.9	8.67	8.79	8.3	8.25	8.79	8.81
ZnO	0.11	0.04	0.08	0.01	0.05	0.07	0.08
NiO	0.1	0.11	0.07	0.11	0.13	0.04	0.1
CoO	-	-	-	-	-	-	-
GeO_2	-	-	-	-	-	-	-
CuO	-	-	-	-	-	-	-
Sum Ox%	94.99	95.7	97.69	94.56	96.65	94.97	94.42
Si	0.054	0.027	0.017	0.004	0.016	0.012	0.015
Ti	0.464	0.548	0.571	0.543	0.52	0.535	0.529
Al/Al^{IV}	0	0	0	0	0	0	0
Al^{VI}	0.026	0.153	0.143	0.173	0.17	0.162	0.17
Cr	0.003	0.011	0.025	0.007	0.01	0.005	0.006
Fe^{3+}	0.926	0.684	0.655	0.726	0.747	0.739	0.736
Fe^{2+}	1.293	1.086	1.104	1.067	1.071	1.045	1.036
V	0.01	0	0	0.001	0.002	0	0
Mn^{2+}	0.052	0.019	0.017	0.024	0.018	0.024	0.023
Mg	0.167	0.466	0.464	0.453	0.441	0.476	0.479
Zn	0.003	0.001	0.002	0	0.001	0.002	0.002
Ni	0.003	0.003	0.002	0.003	0.004	0.001	0.003
Co	-	-	-	-	-	-	-
Ge	-	-	-	-	-	-	-
Cu	-	-	-	-	-	-	-
Sum Cat#	3	3	3	3	3	3	3
XCr	11.1	6.802	14.965	3.689	5.759	3.086	3.637
XFe^{2+}	88.586	69.981	70.42	70.203	70.847	68.695	68.379
YFe^{3+}	96.921	80.614	79.611	80.192	80.589	81.584	80.636

A4.1. Major-element composition of diopsides in the groundmass of the Lucapa kimberlites. Oxides in wt%. Structural formula normalised to 6 oxygens

#Label	H1-7A_d_145	H1-7A_d_146	H1-7A_d_147	H1-7A_d_148	H1-7A_e_149	H1-7A_e_150	H1-7A_e_151	H1-7A_e_152	H1-8 a_ a-7	H1-8a _ a-8	H1-8a _ a-9	H1-8 a _ a-10	H1-8a _ a-11	H1-8b _ a-23	H1-8b _ a-24
Kimberlite	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1
Mineral	diopside	diopside	diopside	diopside	diopside	diopside	diopside	diopside	diopside	diopside	diopside	diopside	diopside	diopside	diopside
SiO_2	53.27	53.67	53.35	52.62	53.39	52.61	54.22	53.68	54.79	54.52	54.9	53.88	52.67	53.2	53.15
TiO_2	0.44	0.35	0.79	1.31	0.63	0.78	0.42	0.76	0.03	0.05	0.02	0.05	0.28	0.85	0.96
Al_2O_3	0.2	0.1	0.25	0.54	0.22	0.31	0.12	0.29	2.93	3.04	2.78	2.92	1.18	0.42	0.54
Cr_2O_3	0	0.02	0	0.01	0	0	0	0.04	2.83	2.98	2.75	2.94	1.74	0.05	0.02
Fe_2O_3	6.34	5.54	6.37	5.48	4.34	5.38	3.76	4.65	0.84	1.09	0.89	2.55	1.86	3.62	3.67
FeO(c.)	0	0	0	0.13	0.04	0	0.37	0.58	1.59	1.43	1.64	0	1.13	0.82	0.82
MnO	0.09	0.19	0.14	0.11	0.08	0.08	0.17	0.16	0.04	0.08	0.06	0.11	0.11	0.06	0.08
MgO	15.55	16.11	15.49	15.74	16.64	15.81	16.69	16.06	14.26	14.08	14.57	14.45	16.54	16.02	15.76
CaO	22.78	24.06	22.53	23.5	24.28	23.76	24.8	24.68	19.22	18.65	19.52	19.05	21.58	24.36	24.17
Na_2O	1.75	1.17	1.73	1.23	0.76	1.23	0.68	0.83	2.99	3.18	2.8	3.14	1.04	0.8	0.96
K_2O	0	0	0.01	0	0	0	0	0.01	0	0	0	0.01	0.01	0	0
Sum Ox%	100.42	101.21	100.65	100.66	100.39	99.96	101.22	101.74	99.53	99.09	99.93	99.1	98.15	100.2	100.15
Si	1.948	1.947	1.945	1.921	1.945	1.933	1.959	1.939	1.99	1.988	1.987	1.966	1.953	1.946	1.945
Ti	0.012	0.01	0.022	0.036	0.017	0.022	0.011	0.021	0.001	0.001	0	0.001	0.008	0.023	0.027
Al/Al^{IV}	0.009	0.004	0.011	0.023	0.009	0.013	0.005	0.012	0.01	0.012	0.013	0.034	0.047	0.018	0.023
Al^{VI}	0	0	0	0	0	0	0	0	0.115	0.119	0.106	0.091	0.004	0	0
Cr	0	0	0	0	0	0	0	0.001	0.081	0.086	0.079	0.085	0.051	0.001	0.001
Fe^{3+}	0.175	0.151	0.175	0.15	0.119	0.149	0.102	0.126	0.023	0.03	0.024	0.07	0.052	0.099	0.101
Fe^{2+}	0	0	0	0.004	0.001	0	0.011	0.018	0.048	0.044	0.05	0	0.035	0.025	0.025
Mn^{2+}	0.003	0.006	0.004	0.003	0.003	0.002	0.005	0.005	0.001	0.002	0.002	0.004	0.004	0.002	0.003
Mg	0.847	0.871	0.842	0.856	0.904	0.866	0.899	0.864	0.772	0.765	0.786	0.786	0.914	0.874	0.859
Ca	0.892	0.935	0.88	0.919	0.948	0.936	0.96	0.955	0.748	0.729	0.757	0.745	0.857	0.955	0.948
Na	0.124	0.083	0.122	0.087	0.054	0.087	0.047	0.058	0.211	0.225	0.196	0.222	0.075	0.057	0.068
K	0	0	0	0	0	0	0	0	0	0	0	0	0.001	0	0
Sum Cat#	4.01	4.007	4.002	4	4	4.008	4	4	4	4	4	4.004	4	4	4
Wo(Ca)	51.295	51.768	51.102	51.652	51.159	51.937	51.331	51.983	47.689	47.401	47.522	48.662	47.459	51.512	51.724
En(Mg)	48.705	48.232	48.898	48.124	48.781	48.063	48.075	47.058	49.227	49.763	49.368	51.338	50.604	47.138	46.902
Fs(Fe^{2+})	0	0	0	0.224	0.06	0	0.594	0.959	3.084	2.837	3.11	0	1.937	1.351	1.374
XMg	1	1	1	0.995	0.999	1	0.988	0.98	0.941	0.946	0.941	1	0.963	0.972	0.972

A4.1. Major-element composition of diopsides in the groundmass of the Lucapa kimberlites. Oxides in wt%. Structural formula normalised to 6 oxygens

#Label	H1-8b _ a-25	H1-7B_b	H1-7B_b	H1-7B_b	H1-8D_d_023	H1-8D_d_024	H1-8D_d_025
Kimberlite	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1
Mineral	diopside	diopside	diopside	diopside	diopside	diopside	diopside
SiO_2	54.33	52.74	53.53	53.86	50.35	50.34	50.63
TiO_2	0.32	1.22	0.68	0.44	0.41	0.45	0.34
Al_2O_3	0.23	0.69	0.46	0.28	4.35	4.62	3.74
Cr_2O_3	0.02	0.03	0.01	0.03	0.25	0.23	0.17
Fe_2O_3	2.49	5.86	4.45	4.67	2.35	1.81	2.28
FeO(c.)	1.26	0.04	0.63	0.52	5.37	5.78	5.34
MnO	0.11	0.1	0.13	0.14	0.12	0.1	0.06
MgO	16.69	16.08	16.24	16.27	12.97	13.03	13.32
CaO	24.78	23.34	23.87	24.17	22.15	22.01	22.81
Na_2O	0.51	1.17	0.93	0.9	0.77	0.71	0.53
K_2O	0.01	0	0.01	0	0	0	0
Sum Ox%	100.73	101.27	100.95	101.27	99.1	99.08	99.24
Si	1.97	1.913	1.943	1.95	1.884	1.882	1.893
Ti	0.009	0.033	0.019	0.012	0.012	0.013	0.01
Al/Al^{IV}	0.01	0.029	0.019	0.012	0.116	0.118	0.107
Al^{VI}	0	0	0	0	0.075	0.086	0.057
Cr	0.001	0.001	0	0.001	0.008	0.007	0.005
Fe^{3+}	0.068	0.16	0.122	0.127	0.066	0.051	0.064
Fe^{2+}	0.038	0.001	0.019	0.016	0.168	0.181	0.167
Mn^{2+}	0.003	0.003	0.004	0.004	0.004	0.003	0.002
Mg	0.902	0.87	0.879	0.878	0.723	0.726	0.742
Ca	0.963	0.907	0.928	0.937	0.888	0.882	0.914
Na	0.036	0.083	0.065	0.063	0.056	0.051	0.039
K	0	0	0.001	0	0	0	0
Sum Cat#	4	4	4	4	4	4	4
Wo(Ca)	50.588	51.018	50.831	51.2	49.902	49.295	50.118
En(Mg)	47.41	48.907	48.115	47.945	40.657	40.601	40.718
$Fs(Fe^{2+})$	2.001	0.075	1.054	0.856	9.441	10.104	9.164
XMg	0.959	0.998	0.979	0.982	0.812	0.801	0.816

A4.1. Major-element composition of serpentine in the groundmass of the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 9 oxygens.

#Label	MGR-11_f_116	MGR-11_f_117	MGR-11_f_118	MGR-11_f_119	MGR-18_g_019	MGR-18_g_020	MGR-18_i_025	MGR-18_i_026	MGR-20B_a_004	MGR-20B_c_011	MGR-20B_c_012	MGR-20B_e_021	MGR-20B_e_022	MGR-20B_f_023	MGR-20B_f_024	MGR-20B_f_025
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Mineral	srp	srp	srp	srp	srp	srp	srp	srp	srp	srp	srp	srp	srp	srp	srp	srp
SiO_2	40.67	39.49	37.55	40.58	50.09	44.81	44.05	44.45	42.72	43	42.83	43.02	45.52	42.22	44.13	41.26
TiO_2	0.02	0.01	0.02	0.13	0.04	0.03	0.07	0.07	0.06	0.09	0.11	0.1	0.04	0.01	0.01	0.03
Al_2O_3	0.8	0.64	5.73	3.99	4.14	2.7	2.09	2.04	1.19	2.07	1.71	2.18	3.41	1.32	2.25	1.35
Cr_2O_3	0.09	0.04	0.04	0.04	0.09	0.15	0.12	0.12	0.03	0.02	0.04	0.35	0.03	0.02	0.09	0.05
Fe_2O_3	4.24	4.01	8.42	6.82	2.26	6.9	8.83	8.99	8.33	8.44	9.67	7.48	5.76	7.35	10.72	6.47
MgO	19.28	15.97	33.49	30.08	23.97	24.97	22.66	23.18	32.47	30.55	32.1	30.22	30.97	33.57	28.25	33.58
CaO	0.89	0.68	0.12	0.57	2.2	1.14	0.77	0.81	0.21	0.7	0.53	0.77	1.26	0.42	0.92	0.44
NiO	0.32	0.4	0.19	0.22	0.17	0.1	0.21	0.24	0.06	0.04	0	0.1	0.09	0.07	0.18	0.04
Na_2O	0.1	0.04	0.07	0.05	0.29	0.12	0.05	0.07	0	0.04	0.03	0.04	0.05	0.01	0.06	0.01
MnO	0.09	0.09	0.12	0.09	0.06	0.07	0.21	0.12	0.14	0.17	0.3	0.17	0.09	0.09	0.26	0.05
K_2O	0.02	0.03	0.03	0.04	0.01	0.02	0	0.01	0	0.01	0	0.01	0.02	0.01	0.01	0
$H_2O_{(c)}$	10.09	9.4	12.44	12.16	12.74	12.09	11.74	11.88	12.49	12.5	12.72	12.43	12.97	12.49	12.68	12.24
Sum Ox%	76.62	70.79	98.21	94.76	96.05	93.11	90.81	91.96	97.7	97.64	100.04	96.87	100.23	97.59	99.57	95.52
Si	2.416	2.52	1.81	2.002	2.357	2.223	2.251	2.244	2.05	2.063	2.019	2.076	2.104	2.028	2.087	2.021
Ti	0.001	0.001	0.001	0.005	0.001	0.001	0.003	0.002	0.002	0.003	0.004	0.004	0.002	0	0	0.001
Al/Al^{IV}	0	0	0.19	0	0	0	0	0	0	0	0	0	0	0	0	0
Al^{VI}	0.056	0.048	0.136	0.232	0.23	0.158	0.126	0.121	0.067	0.117	0.095	0.124	0.186	0.075	0.125	0.078
Cr	0.004	0.002	0.001	0.001	0.003	0.006	0.005	0.005	0.001	0.001	0.001	0.013	0.001	0.001	0.003	0.002
Fe^{3+}	0.19	0.193	0.305	0.253	0.08	0.258	0.339	0.341	0.301	0.305	0.343	0.272	0.2	0.266	0.381	0.239
Mg	1.708	1.519	2.406	2.212	1.681	1.846	1.726	1.744	2.323	2.186	2.255	2.174	2.134	2.403	1.992	2.452
Ca	0.057	0.046	0.006	0.03	0.111	0.061	0.042	0.044	0.011	0.036	0.027	0.04	0.062	0.021	0.047	0.023
Ni	0.015	0.02	0.007	0.009	0.006	0.004	0.009	0.01	0.002	0.002	0	0.004	0.004	0.003	0.007	0.001
Na	0.011	0.004	0.007	0.004	0.027	0.011	0.005	0.006	0	0.003	0.002	0.003	0.005	0.001	0.006	0.001
Mn^{2+}	0.004	0.005	0.005	0.004	0.002	0.003	0.009	0.005	0.006	0.007	0.012	0.007	0.003	0.004	0.011	0.002
K	0.002	0.002	0.002	0.003	0.001	0.001	0	0.001	0	0.001	0	0	0.001	0.001	0.001	0
OH	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Sum Cat#	8.464	8.361	8.877	8.754	8.499	8.572	8.514	8.524	8.763	8.724	8.759	8.717	8.703	8.802	8.66	8.819
XMg	0.9	0.887	0.887	0.897	0.955	0.878	0.836	0.836	0.885	0.878	0.868	0.889	0.914	0.9	0.839	0.911

A4.1. Major-element composition of serpentine in the groundmass of the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 9 oxygens.

#Label	MGR-23_b_052	MGR-23_b_053	MGR-23_d_056	MGR-23_e_057	MGR-23_f_058	MGR-40A_a_123	MGR-40A_a_124	MGR-40A_a_125	MGR-40A_a_126	MGR-40A_d_135	MGR-6A_b_041	MGR-6A_b_042	MGR-6A_d_057	MGR-6A_d_059
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Mineral	srp	srp	srp	srp	srp	srp	srp	srp	srp	srp	srp	srp	srp	srp
SiO_2	38.07	37.15	42.82	36.41	42.84	44.56	41.99	40.48	40.79	42.16	43.16	42.85	41.07	44.65
TiO_2	0.02	0.01	0.05	0.01	0.07	0.1	0.04	0.04	0.06	0.03	0	0.03	0.04	0
Al_2O_3	0	0.44	0.33	0.01	0.15	0.63	1.4	2.09	1.34	2.42	1.01	1.16	0.9	0.7
Cr_2O_3	0.01	0.02	0.01	0.01	0.03	0.03	0.04	0.02	0.02	0.05	0.06	0.07	0.04	0.05
Fe_2O_3	11.01	16.28	2.62	10.24	2.55	7.95	9.22	7.91	9.7	9.67	7.64	6.69	5.45	5.81
MgO	36.77	31.61	39.71	36.6	39.94	28.91	26.25	34.98	34.76	31.32	25.14	30.22	27.29	22.19
CaO	0.03	0.41	0.03	0.06	0.01	0.12	0.2	0.03	0.05	0.2	0.58	0.44	0.83	0.37
NiO	0.2	0.41	0.02	0.24	0.05	0.1	0.28	0.01	0.02	0.17	0.65	0.4	0.6	0.42
Na_2O	0.01	0	0.03	0	0.02	0.05	0.11	0.03	0.04	0.12	0.04	0.03	0	0.02
MnO	0.04	0.23	0.02	0.04	0.02	0.17	0.11	0.06	0.11	0.15	0.17	0.09	0.07	0.08
K_2O	0	0	0.01	0.01	0	0.02	0.05	0.01	0	0.03	0.01	0	0	0.01
$H_2O_{(c)}$	12.31	12.13	12.72	11.93	12.73	12.24	11.72	12.5	12.6	12.58	11.62	12.11	11.32	11.23
Sum Ox%	98.48	98.7	98.36	95.53	98.39	94.89	91.42	98.17	99.49	98.9	90.06	94.1	87.61	85.52
Si	1.855	1.837	2.018	1.83	2.018	2.183	2.149	1.942	1.942	2.009	2.228	2.122	2.176	2.385
Ti	0.001	0	0.002	0	0.002	0.004	0.002	0.001	0.002	0.001	0	0.001	0.002	0
Al/Al^{IV}	0	0.026	0	0.001	0	0	0	0.058	0.058	0	0	0	0	0
Al^{VI}	0	0	0.018	0	0.008	0.036	0.084	0.06	0.017	0.136	0.061	0.068	0.056	0.044
Cr	0.001	0.001	0	0	0.001	0.001	0.002	0.001	0.001	0.002	0.002	0.003	0.002	0.002
Fe^{3+}	0.404	0.606	0.093	0.387	0.091	0.293	0.355	0.285	0.348	0.347	0.297	0.249	0.217	0.234
Mg	2.67	2.329	2.789	2.742	2.805	2.111	2.002	2.501	2.466	2.224	1.934	2.23	2.156	1.767
Ca	0.002	0.022	0.002	0.003	0.001	0.006	0.011	0.001	0.003	0.01	0.032	0.024	0.047	0.021
Ni	0.008	0.016	0.001	0.01	0.002	0.004	0.012	0	0.001	0.006	0.027	0.016	0.026	0.018
Na	0.001	0	0.002	0	0.002	0.005	0.01	0.003	0.004	0.011	0.004	0.003	0	0.002
Mn^{2+}	0.002	0.01	0.001	0.002	0.001	0.007	0.005	0.003	0.005	0.006	0.007	0.004	0.003	0.004
K	0	0	0.001	0	0	0.001	0.003	0.001	0	0.002	0.001	0	0	0
OH	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Sum Cat#	8.942	8.847	8.926	8.976	8.93	8.652	8.635	8.857	8.846	8.754	8.594	8.719	8.685	8.476
XMg	0.869	0.794	0.968	0.876	0.969	0.878	0.849	0.898	0.876	0.865	0.867	0.9	0.908	0.883

A4.1. Major-element composition of carbonates in the groundmass of the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

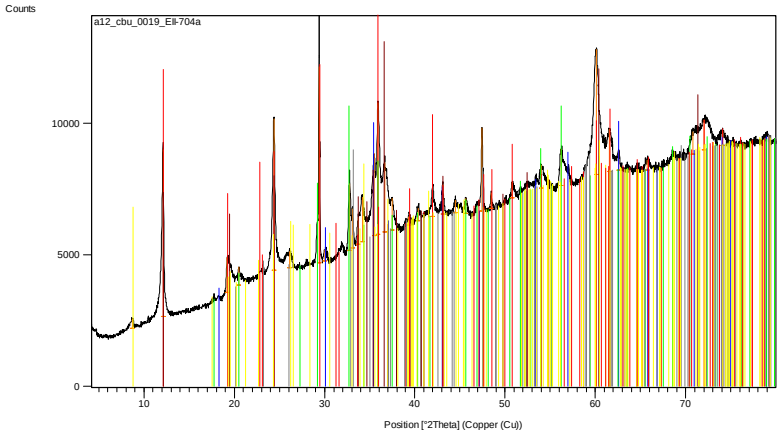
#Label	MGR-20A-a_065	MGR-18_g_017	MGR-18_g_018	MGR-23_g_059	MGR-23_g_060	MGR-22_e_076	H1-9_b	H1-9_b
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Lucapa 1	Lucapa 1
Mineral	calcite	calcite	calcite	calcite	calcite	calcite	calcite	calcite
SiO_2	0.04	0.15	0.12	0.01	0.2	0.01	0.08	0.01
$FeCO_3$	0.15	0.03	0	0.18	0.27	0.14	0.02	0.01
$MnCO_3$	0.03	0	0	0.12	0	0.03	0.01	0.03
MgCO3	0	0	0	0	0.23	0	0.05	0.1
$CaCO_3$	101.97	101.67	103.11	103.01	99.93	100.26	101.35	99.27
$BaCO_3$	-	-	-	-	-	-	-	-
$SrCO_3$	-	-	-	-	-	-	-	-
N_a2Ca^*2	0	0.39	0.45	0.2	-	-	0.12	0
K_2Ca^*2	0.07	0	0	0	-	-	-	-
$PbCO_3$	-	-	-	-	-	-	-	-
$ZnCO_3$	-	-	-	-	0.02	0	0	0
$NiCO_3$	0.08	0	0	0.01	0	0.01	-	-
$CoCO_3$	-	-	-	-	-	-	-	-
$CdCO_3$	-	-	-	-	-	-	-	-
$Cu_{2..}$	-	-	-	-	-	-	-	-
Sum Ox%	102.35	102.24	103.68	103.54	100.65	100.44	101.63	99.42
Si	0.001	0.002	0.002	0	0.003	0	0.001	0
Fe^{2+}	0.001	0	0	0.002	0.002	0.001	0	0
Mn^{2+}	0	0	0	0.001	0	0	0	0
Mg	0	0	0	0	0.003	0	0.001	0.001
Ca	0.997	0.994	0.996	0.997	0.989	0.998	0.996	0.998
Ba	-	-	-	-	-	-	-	-
Sr	-	-	-	-	-	-	-	-
Na	0	0.001	0.001	0	-	-	0	0
K	0	0	0	0	-	-	-	-
Pb	-	-	-	-	-	-	-	-
Zn	-	-	-	-	0	0	0	0
Ni	0.001	0	0	0	0	0	-	-
Co	-	-	-	-	-	-	-	-
Cd	-	-	-	-	-	-	-	-
Cu	-	-	-	-	-	-	-	-
Sum Cat#	1	0.998	0.999	1	0.997	1	0.999	1
Malachite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Buetschildite	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eitelite	0.00	0.08	0.09	0.04	0.00	0.00	0.02	0.00
Otavite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cobaltocalcite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gaspeite	0.07	0.00	0.00	0.01	0.00	0.01	0.00	0.00
Cerusite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Witherite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Smithsonite	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
Stonianite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rhodochrosite	0.03	0.00	0.00	0.10	0.00	0.03	0.01	0.02
Magnesite	0.00	0.00	0.00	0.00	0.27	0.00	0.06	0.12
Sidérite	0.13	0.02	0.00	0.15	0.23	0.12	0.02	0.01
Calcite	**99.69**	**99.37**	**99.49**	**99.65**	**98.86**	**99.83**	**99.62**	**99.83**

A4.1. Major-element composition of carbonates in the groundmass of the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

#Label	H1-8D_a_007	H1-8D_a_008	H1-8D_b_009	H1-8D_b_010	H1-8D_c_013	H1-8D_c_014	H2-5C_c_077
Kimberlite	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 2
Mineral	calcite	calcite	calcite	calcite	calcite	calcite	calcite
SiO_2	0.04	0.03	0.05	0.03	0.06	0.04	0.21
$FeCO_3$	0	0.03	0.06	0.09	0.3	0.29	1.17
$MnCO_3$	0.01	0.02	0.92	1.14	0.21	0.38	0.28
MgCO3	0	0	0.17	0.32	0	0.2	0.31
$CaCO_3$	105.21	107.6	102.01	107.24	106.9	106.53	98.89
$BaCO_3$	-	-	-	-	-	-	-
$SrCO_3$	-	-	-	-	-	-	-
N_a2Ca*2	0	0.51	0.52	0.16	0.23	0.37	0.52
K_2Ca*2	-	-	-	-	-	-	-
$PbCO_3$	-	-	-	-	-	-	-
$ZnCO_3$	0.03	0.03	0	0.02	0.1	0	0
$NiCO_3$	-	-	-	-	-	-	-
$CoCO_3$	-	-	-	-	-	-	-
$CdCO_3$	-	-	-	-	-	-	-
$Cu_{2..}$	-	-	-	-	-	-	-
Sum Ox%	105.28	108.21	103.72	108.98	107.8	107.82	101.38
Si	0.001	0.001	0.001	0	0.001	0.001	0.003
Fe^{2+}	0	0	0.001	0.001	0.002	0.002	0.01
Mn^{2+}	0	0	0.008	0.009	0.002	0.003	0.002
Mg	0	0	0.002	0.003	0	0.002	0.004
Ca	0.999	0.998	0.988	0.986	0.994	0.991	0.977
Ba	-	-	-	-	-	-	-
Sr	-	-	-	-	-	-	-
Na	0	0.001	0.001	0	0	0.001	0.001
K	-	-	-	-	-	-	-
Pb	-	-	-	-	-	-	-
Zn	0	0	0	0	0.001	0	0
Ni	-	-	-	-	-	-	-
Co	-	-	-	-	-	-	-
Cd	-	-	-	-	-	-	-
Cu	-	-	-	-	-	-	-
Sum Cat#	1	1	1	1	1	1	0.997
Malachite	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Buetschildite	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eitelite	0.00	0.09	0.10	0.03	0.04	0.07	0.10
Otavite	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cobaltocalcite	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gaspeite	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cerusite	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Witherite	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Smithsonite	0.02	0.02	0.00	0.01	0.08	0.00	0.00
Stonianite	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rhodochrosite	0.01	0.01	0.78	0.91	0.17	0.31	0.24
Magnesite	0.00	0.00	0.19	0.35	0.00	0.22	0.36
Sidérite	0.00	0.02	0.05	0.07	0.24	0.24	1.00
Calcite	**99.87**	**99.73**	**98.67**	**98.54**	**99.33**	**99.00**	**97.55**

Mulepe 1: EII-704a

Main Graphics, Analyze View:



Peak List:

Pos. [°2Th.]	Height [cts]	FWHM [°2Th.]	d-spacing [Å]	Rel. Int. [%]
8.7294	341.85	0.2676	10.12990	4.60
12.1117	6335.57	0.1338	7.30761	85.27
19.2195	1315.08	0.1673	4.61814	17.70
20.4836	691.00	0.1338	4.33592	9.30
24.3594	5759.40	0.1338	3.65411	77.51
26.0952	604.17	0.6691	3.41484	8.13
29.3992	7430.40	0.1004	3.03816	100.00
30.0219	410.79	0.3346	2.97654	5.53
32.7151	2549.65	0.1673	2.73741	34.31
33.0695	1487.10	0.1004	2.70887	20.01
33.6864	1003.93	0.2007	2.66066	13.51
34.1525	1711.26	0.2007	2.62541	23.03
35.4655	3136.32	0.3346	2.53117	42.21
35.8798	5012.69	0.1338	2.50289	67.46
36.6351	2638.33	0.4015	2.45300	35.51
37.4635	1214.82	0.3011	2.40064	16.35

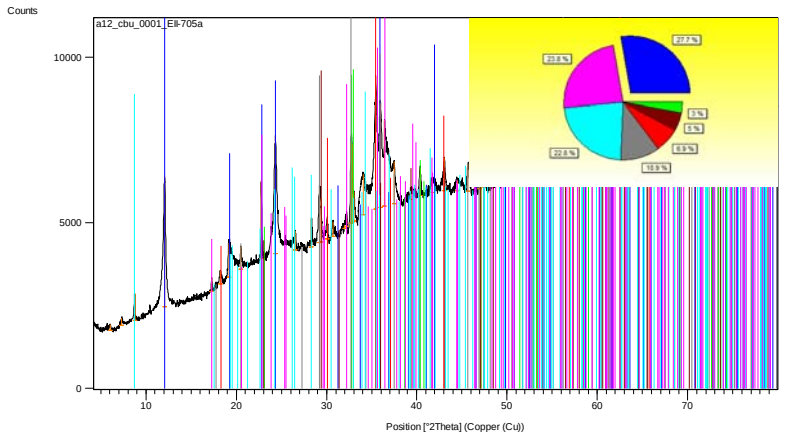
39.3200	289.53	0.4015	2.29147	3.90
40.3851	512.12	0.3346	2.23346	6.89
41.9587	1168.93	0.1673	2.15327	15.73
43.1129	1120.83	0.1338	2.09826	15.08
44.4805	486.15	0.2676	2.03687	6.54
45.6742	573.02	0.2676	1.98638	7.71
47.4729	3143.30	0.1004	1.91523	42.30
48.4693	579.72	0.1338	1.87816	7.80
50.8394	585.22	0.2676	1.79603	7.88
54.0409	860.86	0.3346	1.69695	11.59
56.2021	1380.33	0.2676	1.63671	18.58
60.1286	4721.59	0.4015	1.53888	63.54
61.5896	1590.94	0.4015	1.50584	21.41
62.5805	713.85	0.2007	1.48436	9.61
65.7161	357.42	0.5353	1.42093	4.81
70.7785	853.90	0.5353	1.33120	11.49
72.0077	1125.33	0.6691	1.31148	15.14
74.0927	522.05	0.6528	1.27859	7.03

Pattern List:

Visible	Ref. Code	Score	Compound Name	Displacement [°2Th.]	Scale Factor
*	01-089-6205	45	Lizardite 1T	0.000	0.665
*	01-073-2273	45	Magnetite	0.000	0.305
*	01-078-0319	44	Andradite titanian, syn	0.000	0.390
*	01-086-1393	24	Perovskite	0.000	0.264
*	00-052-1562	45	Clinochrysotile-2\ITM\RG#c#l	0.000	0.513
*	01-089-6513	14	Phlogopite 1M	0.000	0.325
*	01-072-1652	27	Calcite	0.000	0.532

Mulepe 1: EII-705a

Main Graphics, Analyze View:



Peak List:

Pos. [°2Th.]	Height [cts]	FWHM [°2Th.]	d-spacing [Å]	Rel. Int. [%]
6.0131	159.04	0.2007	14.69842	3.97
7.2862	218.98	0.2007	12.13288	5.47
8.7543	805.86	0.0669	10.10122	20.11
12.0914	3964.73	0.1338	7.31981	98.95
17.2744	382.38	0.0836	5.13350	9.54
18.2291	395.63	0.2007	4.86676	9.87
19.1741	1024.27	0.1673	4.62897	25.56
20.4876	664.33	0.1171	4.33508	16.58
22.7592	2361.50	0.1004	3.90728	58.94
24.3390	3557.48	0.1338	3.65711	88.79
26.5212	555.09	0.1338	3.36095	13.85
28.3168	864.22	0.0669	3.15178	21.57
29.1721	1660.05	0.1171	3.06129	41.43
29.3561	1328.87	0.1004	3.04253	33.17
30.0570	622.50	0.1338	2.97315	15.54
30.6636	440.75	0.1338	2.91571	11.00

31.9698	96.38	0.2676	2.79950	2.41
32.2263	333.48	0.1338	2.77780	8.32
32.6840	2447.18	0.1020	2.73767	61.08
32.7822	2374.56	0.0669	2.73196	59.27
33.0221	893.97	0.1004	2.71265	22.31
34.0219	1233.28	0.5353	2.63519	30.78
35.4224	4006.62	0.0502	2.53415	100.00
35.9323	3128.35	0.2007	2.49935	78.08
36.3839	2587.89	0.0669	2.46936	64.59
37.4662	1270.21	0.1338	2.40048	31.70
39.3184	227.77	0.5353	2.29156	5.68
40.3894	832.96	0.1673	2.23323	20.79
41.6956	338.29	0.4015	2.16624	8.44
43.0800	988.67	0.1004	2.09978	24.68
44.5172	297.25	0.6691	2.03527	7.42
45.7098	824.45	0.2007	1.98491	20.58
46.9853	384.52	0.2007	1.93396	9.60
47.4194	644.20	0.1338	1.91726	16.08
50.7838	216.60	0.2676	1.79786	5.41
52.0627	642.36	0.1004	1.75667	16.03
53.3445	875.29	0.1004	1.71744	21.85
54.0709	1023.75	0.1338	1.69608	25.55
56.2850	1842.04	0.3346	1.63450	45.98
56.9598	804.27	0.1004	1.61673	20.07
59.8759	3647.45	0.4015	1.54477	91.04
61.4131	1024.17	0.2007	1.50974	25.56
62.5188	1373.98	0.1004	1.48568	34.29
68.5713	506.40	0.2676	1.36856	12.64
70.5446	827.52	0.6022	1.33504	20.65
71.4459	911.80	0.2007	1.32040	22.76
72.6820	852.82	0.3346	1.30096	21.29
73.9303	326.69	0.5712	1.28099	8.15

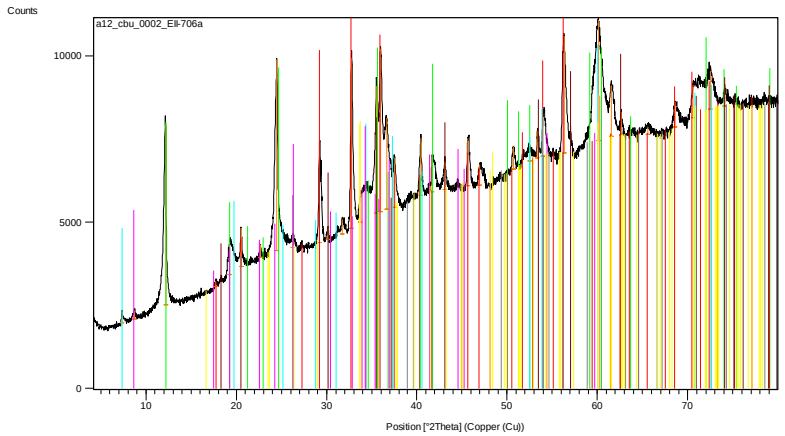
Pattern List:

Visible	Ref. Code	Score	Compound Name	Displacement [°2Th.]	Scale Factor
*	01-086-1345	51	Magnetite	0.000	0.942
*	01-089-6275	35	Lizardite 1T	0.000	1.064
*	01-074-1985	21	Perovskite group	0.000	0.409
*	01-078-0319	48	Andradite titanian, syn	0.000	0.809
*	01-072-1937	21	Calcite	0.000	0.460
*	01-085-2271	17	Phlogopite	0.000	0.609
*	01-083-1481	22	Olivine	0.000	0.559

A4.2. X-Ray Difractograms

Mulepe 1: EII-706a

Main Graphics, Analyze View:



Peak List:

Pos. [°2Th.]	Height [cts]	FWHM [°2Th.]	d-spacing [Å]	Rel. Int. [%]
7.3384	351.76	0.1338	12.04669	6.11
8.7281	241.78	0.2676	10.13145	4.20
12.1762	5442.74	0.1673	7.26902	94.60
17.7131	153.91	0.2007	5.00735	2.67
19.2693	992.91	0.2007	4.60631	17.26
20.5267	1160.16	0.1171	4.32691	20.16
22.6674	376.49	0.1338	3.92289	6.54
24.4750	5753.68	0.1171	3.63711	100.00
26.2540	345.62	0.2007	3.39455	6.01
29.1816	3037.55	0.1338	3.06032	52.79
30.1270	352.86	0.1004	2.96641	6.13
31.7314	417.61	0.2007	2.81998	7.26
32.7288	5113.11	0.1506	2.73629	88.87
33.6834	730.01	0.3346	2.66090	12.69
35.4798	3811.64	0.1171	2.53018	66.25
35.9404	4864.49	0.1338	2.49880	84.55
36.6134	2732.67	0.2676	2.45440	47.49
37.4997	1466.07	0.2007	2.39841	25.48
40.4603	1731.79	0.0502	2.22948	30.10
41.7236	1029.95	0.1673	2.16485	17.90

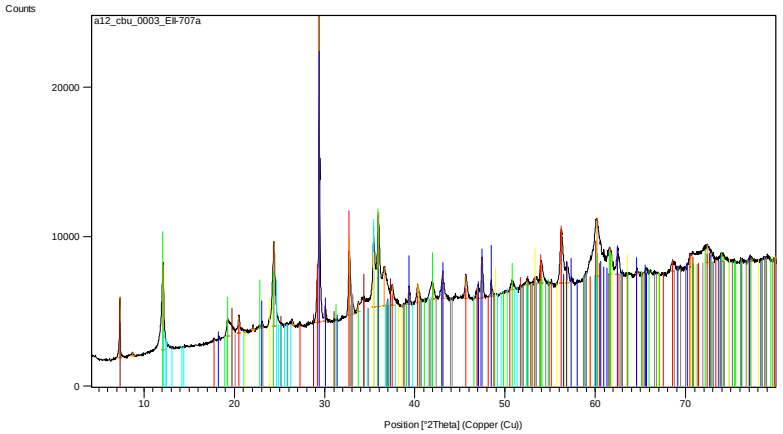
43.1555	811.92	0.1338	2.09628	14.11
45.6625	1415.98	0.2007	1.98686	24.61
46.9822	601.52	0.2676	1.93408	10.45
50.7451	669.70	0.2676	1.79914	11.64
52.4979	367.06	0.4015	1.74313	6.38
53.3738	785.32	0.1338	1.71657	13.65
53.9837	1262.53	0.1338	1.69861	21.94
56.3211	3515.31	0.3346	1.63354	61.10
60.1065	3608.61	0.3346	1.53940	62.72
61.5915	1530.64	0.3346	1.50580	26.60
62.6304	694.51	0.1338	1.48330	12.07
65.5619	234.35	0.8029	1.42389	4.07
68.6276	739.59	0.4015	1.36758	12.85
70.5870	969.13	0.3346	1.33434	16.84
72.5091	1131.55	0.5353	1.30364	19.67
74.0755	576.09	0.3264	1.27884	10.01

Pattern List:

Visible	Ref. Code	Score	Compound Name	Displacement [°2Th.]	Scale Factor
*	01-078-0319	53	Andradite titanian, syn	0.000	0.930
*	00-002-0100	30	Antigorite	0.000	0.491
*	01-074-0764	17	Quartz, syn	0.000	0.140
*	00-011-0614	33	Magnetite	0.000	0.257
*	00-003-0017	33	Hydrobiotite (Chlorite)	0.000	0.255
*	00-024-0867	22	Phlogopite-1\ITM\RG, syn	0.000	0.293
*	01-083-0265	10	Perovskite (Ca,Fe), syn	0.000	0.272

Mulepe 1: EII-707a

Main Graphics, Analyze View:



Peak List:

Pos. [°2Th.]	Height [cts]	FWHM [°2Th.]	d-spacing [Å]	Rel. Int. [%]
7.3269	4077.89	0.0669	12.06553	19.78
8.7228	216.53	0.2007	10.13758	1.05
12.1282	5649.60	0.1171	7.29772	27.40
19.2481	1167.58	0.1004	4.61134	5.66
20.5111	1094.59	0.1171	4.33017	5.31
22.0718	267.03	0.1004	4.02737	1.30
22.9529	203.43	0.5353	3.87473	0.99
24.3719	5628.32	0.1506	3.65226	27.30
26.4115	258.09	0.4015	3.37466	1.25
29.1544	3151.21	0.1004	3.06312	15.28
29.3864	20616.68	0.0669	3.03945	100.00
30.0156	942.23	0.1171	2.97716	4.57
32.7121	4269.23	0.1506	2.73765	20.71
33.0637	1156.77	0.0502	2.70934	5.61
33.7027	588.70	0.1338	2.65941	2.86
35.4002	4663.03	0.0836	2.53569	22.62
35.9416	6264.26	0.1338	2.49872	30.38
36.5988	2593.53	0.2007	2.45535	12.58
37.4620	1357.45	0.2007	2.40073	6.58
39.3889	1141.04	0.0669	2.28762	5.53

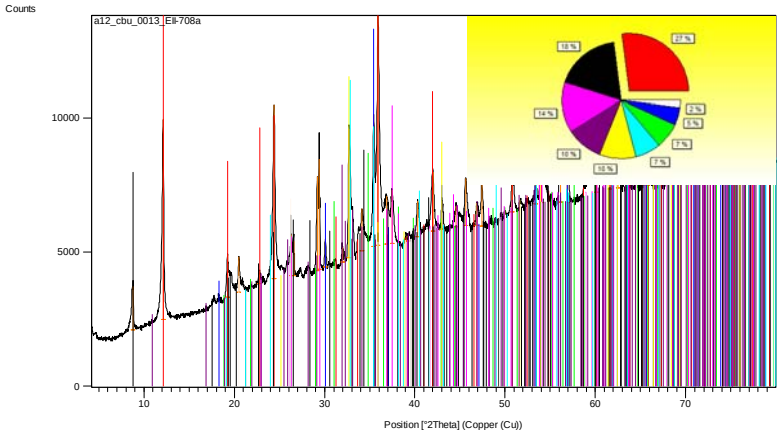
40.3501	1164.97	0.2007	2.23532	5.65
42.0447	952.68	0.2676	2.14906	4.62
43.1404	1845.56	0.0612	2.09525	8.95
45.6583	1539.33	0.1506	1.98703	7.47
47.0084	804.33	0.1673	1.93306	3.90
47.4682	2661.05	0.0836	1.91541	12.91
48.4492	836.20	0.0836	1.87889	4.06
50.7948	611.91	0.3346	1.79750	2.97
52.4528	309.05	0.4015	1.74452	1.50
53.4234	448.34	0.2007	1.71509	2.17
54.0334	1364.79	0.1338	1.69716	6.62
56.1994	3623.57	0.0836	1.63678	17.58
56.8801	1391.60	0.1338	1.61880	6.75
60.1572	3855.48	0.3011	1.53822	18.70
61.6000	1798.76	0.2007	1.50561	8.72
62.4703	1805.89	0.1004	1.48671	8.76
64.6515	208.47	0.4015	1.44173	1.01
65.6053	255.85	0.5353	1.42306	1.24
68.5114	655.07	0.4015	1.36961	3.18
70.6132	816.26	0.6691	1.33391	3.96
72.3906	1185.48	0.2676	1.30548	5.75
74.0484	480.33	0.4015	1.28030	2.33
77.1983	263.77	0.4896	1.23472	1.28

Pattern List:

Visible	Ref. Code	Score	Compound Name	Displacement [°2Th.]	Scale Factor
*	01-086-1346	48	Magnetite	0.000	0.217
*	00-003-0017	27	Hydrobiotite (Chlorite)	0.000	0.095
*	00-052-1573	26	Antigorite	0.000	0.236
*	01-075-1210	27	Ilmenite, syn	0.000	0.214
*	01-078-0319	54	Andradite titanian, syn	0.000	0.279
*	01-072-1937	42	Calcite	0.000	0.729
*	01-089-6275	46	Lizardite 1T	0.000	0.316
*	01-082-0229	18	Perovskite, syn	0.000	0.081

Mulepe 1: EII-708a

Main Graphics, Analyze View:



Peak List:

Pos. [°2Th.]	Height [cts]	FWHM [°2Th.]	d-spacing [Å]	Rel. Int. [%]
8.7603	1618.10	0.2007	10.09433	18.81
12.1304	7455.52	0.1171	7.29639	86.68
19.2492	1586.17	0.1338	4.61108	18.44
20.4872	1321.27	0.1004	4.33516	15.36
22.7787	467.73	0.2676	3.90397	5.44
24.3830	6480.02	0.1506	3.65062	75.34
26.3201	1502.94	0.1338	3.38617	17.47
26.5660	1275.41	0.1004	3.35538	14.83
29.1619	3498.65	0.1338	3.06234	40.68
29.4140	4116.87	0.1004	3.03667	47.87
30.0675	1051.19	0.1171	2.97214	12.22
31.9560	526.80	0.1338	2.80068	6.12
32.6914	4794.04	0.1506	2.73933	55.74
34.1035	1594.58	0.1673	2.62908	18.54
35.4146	4944.93	0.1338	2.53469	57.49
35.8915	8600.91	0.1506	2.50210	100.00
36.8508	1791.05	0.3346	2.43914	20.82
37.4402	2012.54	0.3011	2.40208	23.40
39.2061	186.64	0.5353	2.29786	2.17
40.3284	1324.46	0.2007	2.23647	15.40

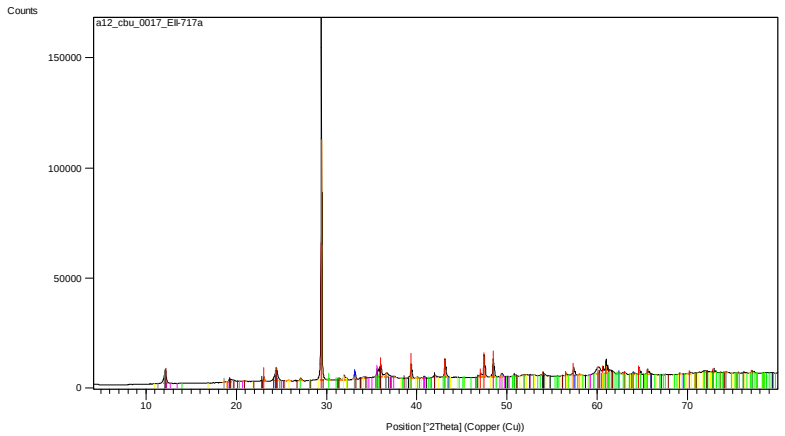
42.0360	2212.82	0.1840	2.14949	25.73
43.0123	1044.66	0.1338	2.10293	12.15
44.6023	774.47	0.2676	2.03159	9.00
45.6472	1768.80	0.2007	1.98749	20.57
46.9197	740.16	0.2007	1.93651	8.61
47.4466	1558.25	0.2007	1.91623	18.12
50.7927	1342.36	0.1673	1.79757	15.61
53.4207	685.03	0.2007	1.71518	7.96
54.0164	1726.43	0.2342	1.69766	20.07
56.1319	3177.77	0.3011	1.63859	36.95
56.8962	1746.69	0.1338	1.61838	20.31
60.1436	4777.87	0.3346	1.53853	55.55
61.6247	2702.32	0.2676	1.50507	31.42
62.4831	1979.23	0.1338	1.48644	23.01
65.8070	370.61	0.5353	1.41918	4.31
68.4950	745.62	0.4015	1.36990	8.67
70.8488	1109.94	0.2676	1.33005	12.90
72.1717	1453.08	0.4684	1.30890	16.89
74.0362	816.59	0.4896	1.27942	9.49

Pattern List:

Visible	Ref. Code	Score	Compound Name	Displacement [°2Th.]	Scale Factor
*	01-089-6205	56	Lizardite 1T	0.000	0.912
*	01-089-0688	53	Magnetite, syn	0.000	0.585
*	01-074-1552	5	Pyrope chromian	0.000	0.257
*	01-089-6513	25	Phlogopite 1M	0.000	0.424
*	01-083-1761	38	Magnesite	0.000	0.488
*	01-087-0690	23	Perovskite (Mg, Si), syn	0.000	0.372
*	01-083-2428	22	Ilmenite magnesian	0.000	0.477
*	01-074-0764	18	Quartz, syn	0.000	0.208
*	01-071-0881	13	Fluorapatite	0.000	0.262

Mulepe 1: EII-717a

Main Graphics, Analyze View:



Peak List:

Pos. [°2Th.]	Height [cts]	FWHM [°2Th.]	d-spacing [Å]	Rel. Int. [%]
12.1599	6340.89	0.1506	7.27874	5.81
18.6775	433.97	0.1004	4.75092	0.40
19.2537	1036.23	0.2007	4.61001	0.95
20.8799	272.64	0.4015	4.25451	0.25
23.0652	1656.69	0.1004	3.85613	1.52
24.4213	5848.27	0.1506	3.64498	5.36
25.7598	501.14	0.1338	3.45854	0.46
27.1390	1408.59	0.1338	3.28584	1.29
29.4276	109104.00	0.1004	3.03529	100.00
30.2129	583.01	0.1338	2.95817	0.53
31.4401	761.28	0.1004	2.84545	0.70
31.9068	1960.00	0.1338	2.80488	1.80
33.0933	3430.94	0.1004	2.70698	3.14
34.0442	680.30	0.2007	2.63352	0.62
35.6077	4654.01	0.1004	2.52139	4.27
35.9703	6396.90	0.1338	2.49680	5.86
36.5858	2081.17	0.2342	2.45619	1.91
37.4809	649.40	0.2007	2.39957	0.60
39.4020	6085.56	0.1004	2.28689	5.58
40.0513	421.23	0.2007	2.25130	0.39

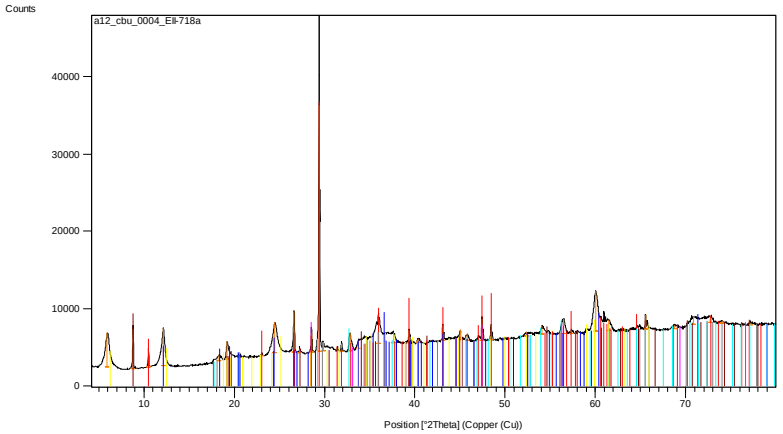
40.8306	757.49	0.1673	2.21011	0.69
42.0276	1096.65	0.2342	2.14990	1.01
43.1450	7505.63	0.1673	2.09677	6.88
47.0962	1945.97	0.1004	1.92966	1.78
47.4779	9396.94	0.1338	1.91504	8.61
48.4797	7740.76	0.1004	1.87778	7.09
49.4069	1596.19	0.2007	1.84469	1.46
50.7537	507.30	0.3011	1.79886	0.46
51.8897	550.69	0.4015	1.76212	0.50
53.9769	1654.68	0.1004	1.69881	1.52
56.5417	1293.94	0.1004	1.62768	1.19
57.3754	3470.72	0.1004	1.60600	3.18
58.0440	449.96	0.1004	1.58909	0.41
60.0661	3103.55	0.3346	1.54034	2.84
61.0312	3058.89	0.2007	1.51827	2.80
62.3762	539.60	0.1004	1.48873	0.49
62.9570	461.62	0.3346	1.47639	0.42
63.9730	931.15	0.1004	1.45537	0.85
64.6397	2647.15	0.1004	1.44196	2.43
65.5737	2269.86	0.1004	1.42367	2.08
69.2180	295.27	0.4015	1.35735	0.27
70.2038	795.02	0.1004	1.34068	0.73
72.0273	934.75	0.5353	1.31117	0.86
72.8827	1927.47	0.1004	1.29787	1.77
74.2531	356.41	0.3346	1.27728	0.33
75.4388	150.46	0.4015	1.26012	0.14
77.1208	1164.80	0.1224	1.23576	1.07

Pattern List:

Visible	Ref. Code	Score	Compound Name	Displacement [°2Th.]	Scale Factor
*	01-072-1937	50	Calcite	0.000	0.367
*	01-089-0598	29	Hematite, syn	0.000	0.027
*	01-089-6275	19	Lizardite 1T	0.000	0.033
*	01-079-1459	7	Fluorapatite	0.000	0.011
*	00-052-1572	18	Antigorite	0.000	0.032
*	01-080-1867	5	Diopside-jadeite	0.000	0.018
*	00-027-1276	24	Clinochrysotile	0.000	0.035
*	00-046-1445	23	Lizardite-6\ITT\RG#1	0.000	0.041

Mulepe 1: EII-718a

Main Graphics, Analyze View:



Peak List:

Pos. [°2Th.]	Height [cts]	FWHM [°2Th.]	d-spacing [Å]	Rel. Int. [%]
5.9283	4363.36	0.1338	14.90847	13.73
8.7928	5096.83	0.1004	10.05703	16.04
10.4941	2299.79	0.1004	8.43011	7.24
12.1632	4765.65	0.2175	7.27677	15.00
18.3255	725.45	0.4015	4.84138	2.28
19.2027	2269.73	0.1004	4.62214	7.14
20.5577	593.87	0.1338	4.32044	1.87
23.0109	270.90	0.2007	3.86509	0.85
24.4784	3939.70	0.2175	3.63660	12.40
26.5902	5369.80	0.1171	3.35239	16.90
27.2251	412.27	0.2007	3.27564	1.30
28.5415	2448.70	0.1004	3.12748	7.71
29.4050	31779.81	0.1338	3.03758	100.00
29.8367	1159.21	0.1338	2.99460	3.65
31.8326	894.40	0.1338	2.81125	2.81
32.7843	2165.44	0.1506	2.73179	6.81
33.7057	984.91	0.3346	2.65918	3.10
35.9655	3704.52	0.1673	2.49712	11.66
37.6305	1226.54	0.2676	2.39037	3.86

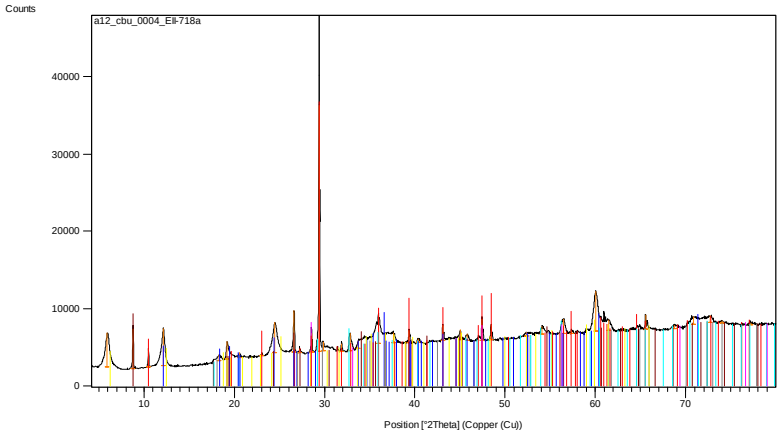
39.3937	1619.31	0.1338	2.28735	5.10
40.4254	461.41	0.2676	2.23133	1.45
43.1234	1912.41	0.1338	2.09777	6.02
45.0526	1251.98	0.2007	2.01233	3.94
45.7945	741.42	0.2676	1.98144	2.33
47.4600	2729.83	0.1004	1.91572	8.59
48.4635	1944.01	0.1004	1.87837	6.12
52.4072	488.54	0.6691	1.74593	1.54
54.1159	967.67	0.3346	1.69477	3.04
56.4674	1855.34	0.4015	1.62965	5.84
57.4093	364.68	0.2676	1.60513	1.15
60.0259	5053.68	0.3680	1.54127	15.90
61.4663	1364.46	0.2676	1.50856	4.29
65.5637	1843.28	0.1004	1.42386	5.80
68.7438	364.97	0.5353	1.36555	1.15
70.8439	1013.56	0.8029	1.33013	3.19
72.7365	857.55	0.5353	1.30012	2.70
74.0379	269.00	0.5353	1.28046	0.85
77.2086	232.21	0.6528	1.23458	0.73

Pattern List:

Visible	Ref. Code	Score	Compound Name	Displacement [°2Th.]	Scale Factor
*	01-072-1937	55	Calcite	0.000	0.671
*	00-052-1562	35	Clinochrysotile-2\ITM\RG#c#l	0.000	0.081
*	01-089-0951	18	Magnetite	0.000	0.020
*	00-042-1437	32	Phlogopite-1\ITM\RG, ferroan	0.000	0.148
*	01-078-0319	33	Andradite titanian, syn	0.000	0.060
*	01-089-4936	43	Sphalerite ferrous, syn	0.000	0.080
*	00-046-1323	22	Clinochlore-1\ITM\RG#I#I\IT#b\RG	0.000	0.047
*	00-009-0436	34	Riebeckite	0.000	0.074
*	00-012-0460	17	Gibbsite, syn	0.000	0.031

Mulepe 1: EII-718a2

Main Graphics, Analyze View:



Peak List:

Pos. [°2Th.]	Height [cts]	FWHM [°2Th.]	d-spacing [Å]	Rel. Int. [%]
5.9283	4363.36	0.1338	14.90847	13.73
8.7928	5096.83	0.1004	10.05703	16.04
10.4941	2299.79	0.1004	8.43011	7.24
12.1632	4765.65	0.2175	7.27677	15.00
18.3255	725.45	0.4015	4.84138	2.28
19.2027	2269.73	0.1004	4.62214	7.14
20.5577	593.87	0.1338	4.32044	1.87
23.0109	270.90	0.2007	3.86509	0.85
24.4784	3939.70	0.2175	3.63660	12.40
26.5902	5369.80	0.1171	3.35239	16.90
27.2251	412.27	0.2007	3.27564	1.30
28.5415	2448.70	0.1004	3.12748	7.71
29.4050	31779.81	0.1338	3.03758	100.00
29.8367	1159.21	0.1338	2.99460	3.65
31.8326	894.40	0.1338	2.81125	2.81
32.7843	2165.44	0.1506	2.73179	6.81
33.7057	984.91	0.3346	2.65918	3.10
35.9655	3704.52	0.1673	2.49712	11.66
37.6305	1226.54	0.2676	2.39037	3.86

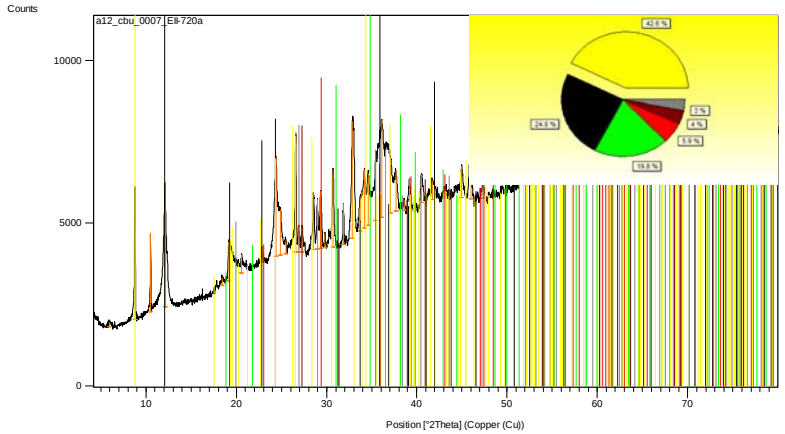
39.3937	1619.31	0.1338	2.28735	5.10
40.4254	461.41	0.2676	2.23133	1.45
43.1234	1912.41	0.1338	2.09777	6.02
45.0526	1251.98	0.2007	2.01233	3.94
45.7945	741.42	0.2676	1.98144	2.33
47.4600	2729.83	0.1004	1.91572	8.59
48.4635	1944.01	0.1004	1.87837	6.12
52.4072	488.54	0.6691	1.74593	1.54
54.1159	967.67	0.3346	1.69477	3.04
56.4674	1855.34	0.4015	1.62965	5.84
57.4093	364.68	0.2676	1.60513	1.15
60.0259	5053.68	0.3680	1.54127	15.90
61.4663	1364.46	0.2676	1.50856	4.29
65.5637	1843.28	0.1004	1.42386	5.80
68.7438	364.97	0.5353	1.36555	1.15
70.8439	1013.56	0.8029	1.33013	3.19
72.7365	857.55	0.5353	1.30012	2.70
74.0379	269.00	0.5353	1.28046	0.85
77.2086	232.21	0.6528	1.23458	0.73

Pattern List:

Visible	Ref. Code	Score	Compound Name	Displacement [°2Th.]	Scale Factor
*	01-072-1937	55	Calcite	0.000	0.671
*	00-052-1562	35	Clinochrysotile-2\ITM\RG#c#l	0.000	0.081
*	01-089-0951	18	Magnetite	0.000	0.020
*	00-042-1437	32	Phlogopite-1\ITM\RG, ferroan	0.000	0.148
*	01-078-0319	33	Andradite titanian, syn	0.000	0.060
*	01-089-4936	43	Sphalerite ferrous, syn	0.000	0.080
*	00-046-1323	22	Clinochlore-1\ITM\RG#I#I\IT#b\RG	0.000	0.047
*	00-009-0436	34	Riebeckite	0.000	0.074
*	00-012-0460	17	Gibbsite, syn	0.000	0.031

Mulepe 2: EII-720a

Main Graphics, Analyze View:



Peak List:

Pos. [°2Th.]	Height [cts]	FWHM [°2Th.]	d-spacing [Å]	Rel. Int. [%]
5.9841	109.88	0.4015	14.76974	2.56
8.7890	4109.62	0.0669	10.06141	95.75
10.5066	2412.03	0.0502	8.42009	56.20
12.1200	3830.02	0.1004	7.30264	89.24
18.4645	218.77	0.2676	4.80523	5.10
19.1763	1163.15	0.1673	4.62844	27.10
20.5886	555.84	0.1338	4.31405	12.95
22.8783	480.15	0.1338	3.88720	11.19
24.3803	3102.98	0.1171	3.65101	72.30
24.8811	1392.38	0.1673	3.57865	32.44
25.4776	410.29	0.1338	3.49620	9.56
26.5511	3698.75	0.0836	3.35724	86.18
26.9017	782.65	0.1338	3.31427	18.24
27.2916	811.85	0.1673	3.26780	18.92
28.5132	1744.86	0.1171	3.13052	40.66
28.9544	1523.62	0.0669	3.08381	35.50
29.2961	1758.28	0.1171	3.04862	40.97
29.8191	433.00	0.1004	2.99633	10.09
30.6944	2386.57	0.1171	2.91285	55.61

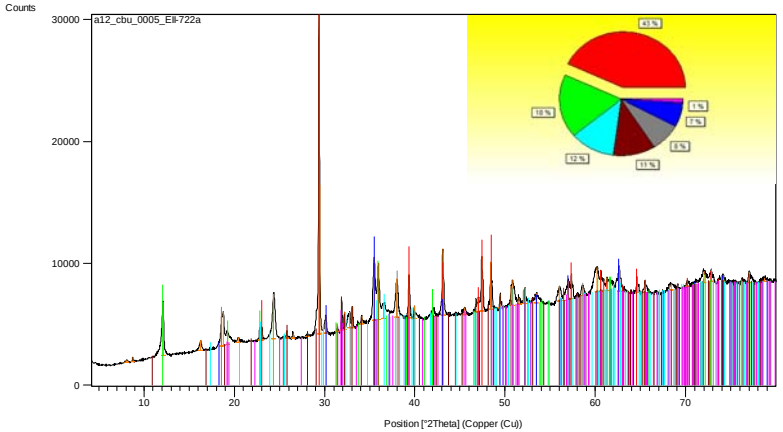
31.8359	1271.90	0.0669	2.81097	29.64
32.8354	3582.90	0.1673	2.72765	83.48
33.7077	1066.97	0.2007	2.65903	24.86
34.1481	1812.42	0.1673	2.62574	42.23
34.5936	1594.13	0.1673	2.59294	37.14
35.4246	2005.27	0.1338	2.53400	46.72
36.0697	3002.13	0.2007	2.49015	69.95
37.0482	1733.65	0.5353	2.42659	40.39
37.6516	1248.42	0.2007	2.38908	29.09
38.6126	291.84	0.2007	2.33180	6.80
39.2195	903.69	0.1338	2.29711	21.06
40.5330	871.58	0.1673	2.22565	20.31
41.7731	559.24	0.2676	2.16240	13.03
43.1111	275.68	0.3346	2.09834	6.42
44.9877	972.80	0.1673	2.01508	22.67
46.0195	1028.44	0.2676	1.97227	23.96
47.3910	393.00	0.4015	1.91835	9.16
51.9986	835.87	0.4684	1.75869	19.48
53.4692	813.79	0.2676	1.71373	18.96
54.3065	1365.16	0.2676	1.68927	31.81
55.6083	453.78	0.2676	1.65277	10.57
56.5412	2331.04	0.2676	1.62770	54.31
60.0805	4291.86	0.2007	1.54000	100.00
61.5879	948.93	0.3346	1.50588	22.11
62.4823	732.75	0.1338	1.48646	17.07
63.4803	285.07	0.5353	1.46547	6.64
68.8262	593.33	0.3346	1.36411	13.82
70.9227	1202.53	0.5353	1.32885	28.02
71.8695	1061.61	0.3346	1.31366	24.74
72.7590	933.77	0.4015	1.29978	21.76
73.9283	336.77	0.5712	1.28102	7.85

Pattern List:

Visible	Ref. Code	Score	Compound Name	Displacement [°2Th.]	Scale Factor
*	01-072-1937	16	Calcite	0.000	0.458
*	01-089-6275	30	Lizardite 1T	0.000	0.793
*	01-089-6513	28	Phlogopite 1M	0.000	0.893
*	01-074-1552	4	Pyrope chromian	0.000	0.657
*	01-089-2655	27	Zircon	0.000	0.343
*	01-076-0320	21	Rutile, syn	0.000	0.340

Mulepe 2: EII-722a

Main Graphics, Analyze View:



Peak List:

Pos. [°2Th.]	Height [cts]	FWHM [°2Th.]	d-spacing [Å]	Rel. Int. [%]
8.0699	175.39	0.2676	10.95632	0.67
8.7628	336.11	0.0502	10.09145	1.28
12.1246	4322.90	0.1506	7.29984	16.50
16.2561	830.89	0.1338	5.45272	3.17
18.5880	2364.87	0.1171	4.77359	9.02
18.7785	2767.32	0.1004	4.72558	10.56
19.2241	1015.44	0.2342	4.61706	3.87
20.4203	446.40	0.1338	4.34921	1.70
22.7846	1014.42	0.0669	3.90297	3.87
23.0416	1076.05	0.0836	3.86002	4.11
24.3399	3618.77	0.1338	3.65699	13.81
25.8038	616.39	0.0669	3.45274	2.35
26.4812	349.74	0.2007	3.36594	1.33
28.1045	203.54	0.2007	3.17510	0.78
29.3641	26205.55	0.0816	3.03919	100.00
29.4531	12218.10	0.0408	3.03774	46.62
30.1211	1413.86	0.1020	2.96452	5.40
31.3884	266.10	0.1224	2.84765	1.02

31.8672	2508.82	0.0816	2.80595	9.57
32.1753	1402.97	0.0612	2.77978	5.35
32.7646	1298.17	0.1224	2.73112	4.95
33.0430	1707.03	0.0612	2.70874	6.51
34.0747	645.70	0.1224	2.62905	2.46
35.4719	5179.59	0.1224	2.52863	19.77
35.9388	4481.23	0.0612	2.49684	17.10
36.5309	1216.91	0.2448	2.45772	4.64
37.9705	3173.53	0.2244	2.36778	12.11
39.3697	3573.57	0.0816	2.28680	13.64
39.9812	1016.93	0.0612	2.25322	3.88
42.0152	587.70	0.4080	2.14872	2.24
43.1213	5424.60	0.0816	2.09613	20.70
43.2464	2906.23	0.0612	2.09555	11.09
45.5447	535.17	0.4080	1.99007	2.04
46.8017	1096.07	0.0816	1.93951	4.18
47.0778	1129.79	0.1224	1.92878	4.31
47.4390	4457.54	0.1020	1.91493	17.01
48.4455	3864.66	0.0816	1.87747	14.75
49.4682	1072.76	0.0612	1.84102	4.09
50.6901	1569.85	0.1224	1.79948	5.99
50.8593	2070.02	0.1632	1.79388	7.90
51.5520	473.29	0.2448	1.77140	1.81
52.0756	1088.16	0.0612	1.75481	4.15
52.2172	1307.63	0.0612	1.75039	4.99
53.4932	749.18	0.2448	1.71160	2.86
56.0295	1251.30	0.2856	1.63999	4.77
56.5145	677.09	0.1224	1.62706	2.58
57.0246	1500.01	0.1224	1.61371	5.72
57.3596	1967.30	0.1020	1.60508	7.51
58.5894	723.04	0.3264	1.57428	2.76
60.2056	1947.71	0.4896	1.53583	7.43
60.6243	1679.83	0.0816	1.52622	6.41
61.2857	1086.61	0.1224	1.51132	4.15
62.6389	1995.94	0.1428	1.48189	7.62
64.6110	1251.20	0.1020	1.44134	4.77
65.5011	992.33	0.1224	1.42389	3.79
68.3935	470.40	0.6528	1.37055	1.80
70.2077	439.69	0.2448	1.33951	1.68
72.0385	906.66	0.3264	1.30990	3.46
72.8439	959.90	0.2040	1.29740	3.66
74.1299	547.36	0.2448	1.27804	2.09
77.0592	895.49	0.2040	1.23660	3.42
78.7392	284.90	0.6528	1.21437	1.09

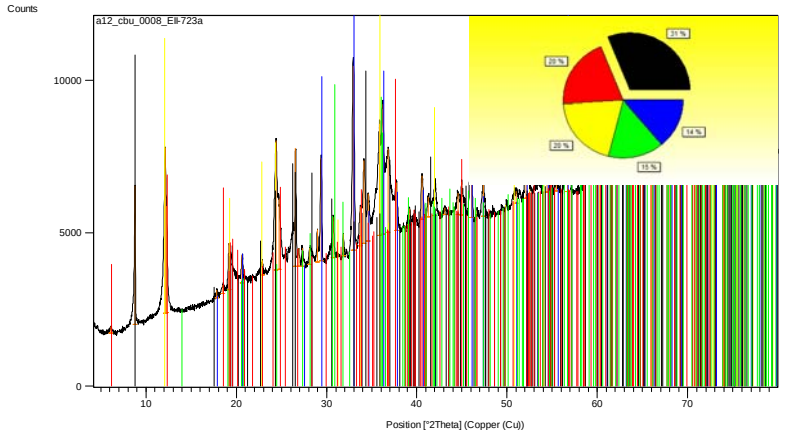
Pattern List:

Visible	Ref. Code	Score	Compound Name	Displacement [°2Th.]	Scale Factor
*	01-072-1937	69	Calcite	0.000	0.988
*	01-080-0390	50	Magnetite	0.000	0.208
*	01-089-6275	38	Lizardite 1T	0.000	0.175
*	01-083-0114	48	Brucite	0.000	0.116
*	01-079-1459	34	Fluorapatite	0.000	0.083
*	01-085-1346	16	Forsterite	0.000	0.060
*	01-082-1503	12	Perovskite, syn	0.000	0.049

A4.2. X-Ray Difractograms

Mulepe 2: EII-723a

Main Graphics, Analyze View:



Peak List:

Pos. [°2Th.]	Height [cts]	FWHM [°2Th.]	d-spacing [Å]	Rel. Int. [%]
6.1322	198.96	0.2007	14.41328	3.31
8.7882	4537.66	0.0502	10.06226	75.42
12.1308	5406.89	0.0836	7.29613	89.87
12.2754	3481.46	0.0669	7.21051	57.87
17.8477	247.83	0.2007	4.96990	4.12
18.5267	267.44	0.2676	4.78925	4.45
19.2208	1497.50	0.1338	4.61783	24.89
20.6506	915.41	0.1338	4.30123	15.21
22.8720	466.02	0.1338	3.88826	7.75
24.3984	4235.46	0.1506	3.64835	70.40
24.7118	2302.95	0.1338	3.60278	38.28
26.5351	3851.61	0.0836	3.35923	64.02
26.8981	571.52	0.1004	3.31471	9.50
27.3106	575.97	0.1338	3.26558	9.57
28.1075	516.21	0.2007	3.17478	8.58
28.9513	1039.84	0.1004	3.08413	17.28
29.4010	3347.49	0.1506	3.03798	55.64
30.6775	1296.68	0.1171	2.91441	21.55
31.8306	699.12	0.0836	2.81143	11.62
32.9784	6016.49	0.2175	2.71615	100.00

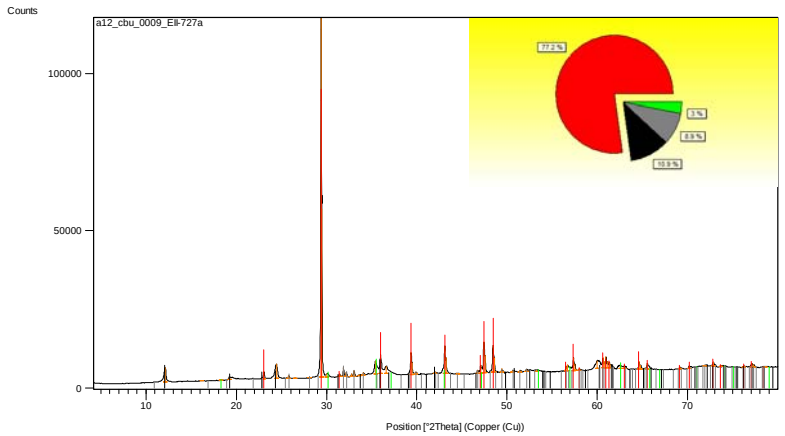
33.7130	1290.34	0.2007	2.65863	21.45
34.1219	2729.47	0.1338	2.62770	45.37
34.5821	1568.03	0.1004	2.59377	26.06
35.8367	3641.19	0.1338	2.50579	60.52
36.2138	4253.14	0.0836	2.48057	70.69
36.7955	2749.21	0.3346	2.44268	45.69
37.7154	1565.87	0.2007	2.38519	26.03
39.2141	546.62	0.1338	2.29741	9.09
40.5878	1409.33	0.2342	2.22277	23.42
41.3056	663.67	0.2007	2.18579	11.03
41.9949	989.79	0.2342	2.15149	16.45
43.1713	217.61	0.4015	2.09556	3.62
44.5672	694.63	0.2007	2.03311	11.55
44.9825	1088.63	0.1004	2.01530	18.09
46.0547	2104.39	0.2007	1.97085	34.98
47.4031	1084.80	0.2342	1.91788	18.03
50.9875	381.40	0.5353	1.79116	6.34
52.0995	939.49	0.3346	1.75552	15.62
54.4205	2524.19	0.3680	1.68600	41.95
55.4970	276.73	0.2676	1.65582	4.60
56.7062	4270.92	0.1506	1.62335	70.99
60.0868	5490.45	0.0836	1.53985	91.26
60.9889	1787.03	0.2676	1.51922	29.70
61.5569	1369.29	0.2676	1.50656	22.76
62.4914	517.72	0.2007	1.48626	8.61
63.4801	242.97	0.5353	1.46547	4.04
65.8999	206.73	0.4015	1.41741	3.44
68.3616	410.97	0.2676	1.37225	6.83
69.1866	845.91	0.2342	1.35789	14.06
70.9250	1674.73	0.2342	1.32881	27.84
71.9119	1219.27	0.4015	1.31299	20.27
73.0309	996.12	0.6022	1.29561	16.56
74.0684	363.24	0.4015	1.28001	6.04
77.7755	181.63	0.4896	1.22699	3.02

Pattern List:

Visible	Ref. Code	Score	Compound Name	Displacement [°2Th.]	Scale Factor
*	01-089-6275	40	Lizardite 1T	0.000	0.739
*	01-089-0846	43	Andradite (Ti-bearing)	0.000	0.847
*	01-089-6513	29	Phlogopite 1M	0.000	0.726
*	01-072-1385	29	Clinochlore, chromian 1\ITM\RG	0.000	0.408
*	01-082-0599	20	Diopside	0.000	0.465

Mulepe 2: EII-727a

Main Graphics, Analyze View:



Peak List:

Pos. [°2Th.]	Height [cts]	FWHM [°2Th.]	d-spacing [Å]	Rel. Int. [%]
12.1383	4501.10	0.1171	7.29163	3.92
16.2052	50.50	0.4015	5.46972	0.04
18.3030	134.68	0.2007	4.84727	0.12
19.2613	782.59	0.2007	4.60821	0.68
23.0478	2172.67	0.0836	3.85899	1.89
24.4418	4404.75	0.1673	3.64198	3.84
25.7882	727.46	0.0669	3.45480	0.63
26.4810	231.89	0.1004	3.36597	0.20
28.0875	196.12	0.1338	3.17699	0.17
29.3857	114702.90	0.0816	3.03701	100.00
29.4764	53490.98	0.0408	3.03539	46.63
29.9881	978.44	0.2040	2.97737	0.85
31.4096	828.57	0.0816	2.84578	0.72
31.8430	2870.41	0.0612	2.80803	2.50
32.1576	1114.70	0.0816	2.78127	0.97
32.7228	822.62	0.0612	2.73452	0.72
33.0172	1719.71	0.0816	2.71080	1.50
33.6477	465.12	0.2040	2.66143	0.41
34.0530	738.70	0.0612	2.63068	0.64
35.3867	3970.50	0.0816	2.53452	3.46

35.9526	5951.38	0.0612	2.49592	5.19
36.5761	2222.08	0.2448	2.45479	1.94
39.3877	6946.41	0.0816	2.28579	6.06
39.5009	3612.98	0.0408	2.28517	3.15
39.9362	702.11	0.0816	2.25565	0.61
42.0572	374.48	0.3264	2.14668	0.33
43.1382	8707.98	0.0816	2.09535	7.59
43.2576	4839.76	0.0612	2.09504	4.22
44.5482	156.71	0.4896	2.03225	0.14
46.7562	1033.50	0.0612	1.94129	0.90
47.0854	2493.20	0.0816	1.92848	2.17
47.4620	9845.52	0.0816	1.91406	8.58
47.6000	5462.10	0.0612	1.91357	4.76
48.4666	8399.01	0.1020	1.87670	7.32
48.6044	4598.84	0.0612	1.87636	4.01
49.4351	1157.76	0.0816	1.84218	1.01
50.6237	510.08	0.1224	1.80168	0.44
51.4431	432.50	0.1224	1.77489	0.38
52.1591	494.72	0.1224	1.75220	0.43
53.3042	370.16	0.4896	1.71722	0.32
56.5309	1427.85	0.0816	1.62662	1.24
56.6936	1888.72	0.1020	1.62234	1.65
57.3714	3993.52	0.0816	1.60477	3.48
57.5354	2023.84	0.0612	1.60457	1.76
58.0162	539.50	0.1224	1.58846	0.47
60.0040	2445.05	0.3264	1.54051	2.13
60.6354	3223.87	0.0816	1.52597	2.81
60.8115	1961.70	0.0612	1.52575	1.71
60.9712	3509.14	0.0816	1.51836	3.06
61.1462	1978.77	0.0816	1.51820	1.73
61.3436	1511.40	0.0816	1.51004	1.32
61.5011	978.65	0.1428	1.50655	0.85
62.5511	986.44	0.1632	1.48376	0.86
63.0034	867.40	0.1224	1.47419	0.76
64.6239	2259.61	0.1020	1.44108	1.97
64.8043	1109.46	0.1020	1.44108	0.97
65.5551	1720.66	0.1428	1.42285	1.50
69.1283	485.25	0.1224	1.35776	0.42
70.1814	702.49	0.1632	1.33995	0.61
71.9084	359.81	0.3264	1.31195	0.31
72.8345	1233.08	0.0816	1.29754	1.08
73.6390	356.63	0.1224	1.28534	0.31
73.8322	161.80	0.6528	1.28245	0.14
76.2318	407.56	0.1632	1.24794	0.36
77.0707	1250.72	0.1632	1.23644	1.09
77.3178	818.73	0.1224	1.23617	0.71
78.5796	248.57	0.8160	1.21643	0.22

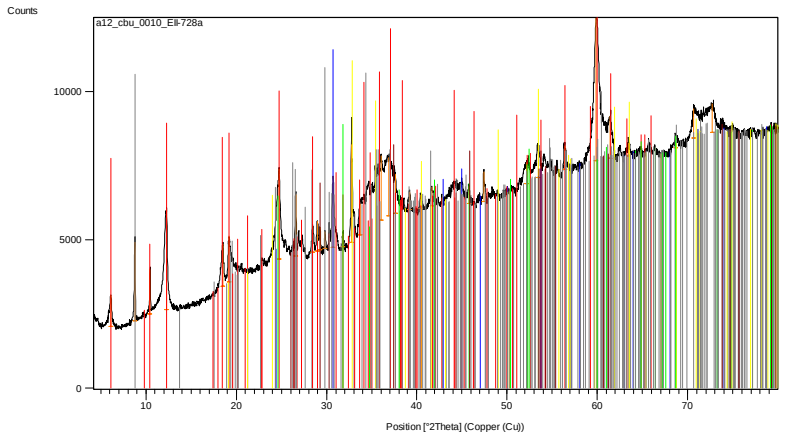
Pattern List:

Visible	Ref. Code	Score	Compound Name	Displacement [°2Th.]	Scale Factor
*	01-072-1937	56	Calcite	0.000	0.709
*	01-089-6275	19	Lizardite 1T	0.000	0.040
*	01-080-0390	14	Magnetite	0.000	0.036
*	01-079-1459	20	Fluorapatite	0.000	0.027

A4.2. X-Ray Difractograms

Mulepe 2: EII-728a

Main Graphics, Analyze View:



Peak List:

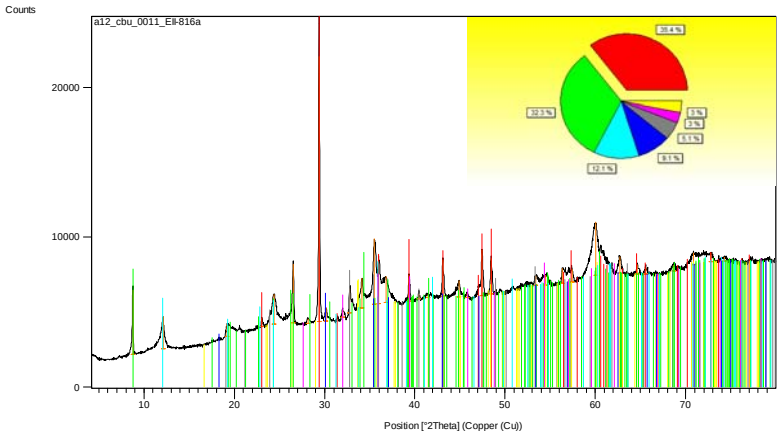
Pos. [°2Th.]	Height [cts]	FWHM [°2Th.]	d-spacing [Å]	Rel. Int. [%]
6.1237	1022.84	0.1338	14.43321	21.27
8.7665	2642.45	0.1004	10.08712	54.95
10.4579	1484.01	0.1004	8.45924	30.86
12.2679	3392.62	0.2676	7.21492	70.55
18.4908	1413.68	0.1673	4.79845	29.40
19.2015	1543.02	0.1506	4.62243	32.09
24.7324	3024.88	0.4015	3.59983	62.90
26.5520	2064.77	0.1338	3.35712	42.94
28.4439	896.29	0.1673	3.13798	18.64
28.9655	982.95	0.1338	3.08266	20.44
29.2374	763.14	0.1004	3.05460	15.87
29.8118	566.01	0.1338	2.99704	11.77
30.7050	2409.38	0.1673	2.91187	50.10
31.7890	416.82	0.1338	2.81501	8.67
32.7541	3296.26	0.1004	2.73424	68.54
33.6671	1065.59	0.3346	2.66215	22.16
36.0162	2174.22	0.2007	2.49372	45.21
36.8581	1975.73	0.6691	2.43867	41.08
37.5689	1328.32	0.2007	2.39415	27.62
39.2452	578.71	0.2007	2.29566	12.03

40.4517	439.75	0.2676	2.22994	9.14
41.6853	611.21	0.2676	2.16676	12.71
45.7853	560.77	0.2007	1.98181	11.66
47.4428	977.41	0.1004	1.91637	20.32
52.1807	705.40	0.5353	1.75298	14.67
53.4567	1074.76	0.2676	1.71410	22.35
56.3993	792.62	0.2007	1.63146	16.48
59.8314	4808.98	0.4015	1.54581	100.00
61.4296	1396.26	0.3346	1.50938	29.03
63.4550	396.78	0.4015	1.46600	8.25
68.7009	353.41	0.5353	1.36630	7.35
70.6673	985.97	0.3346	1.33302	20.50
72.7377	962.03	0.8160	1.29903	20.00

Pattern List:

Visible	Ref. Code	Score	Compound Name	Displacement [°2Th.]	Scale Factor
*	00-020-0671	39	Clinochlore-2\ITA\RG, chromian	0.000	0.503
*	01-080-2148	26	Quartz	0.000	0.532
*	01-089-6513	24	Phlogopite 1M	0.000	0.663
*	01-083-2428	19	Ilmenite magnesian	0.000	0.488
*	00-039-0373	32	Potassicpargasite	0.000	0.312
*	01-085-1109	26	Rhodochrosite	0.000	0.330
*	01-081-0487	19	Diopside	0.000	0.488
*	00-024-0057	24	Chalcocite, high	0.000	0.187

Calonda: EII-816a



Peak List:

Pos. [°2Th.]	Height [cts]	FWHM [°2Th.]	d-spacing [Å]	Rel. Int. [%]
8.7555	4269.44	0.1004	10.09976	24.15
12.1124	2128.38	0.1171	7.30721	12.04
19.1986	769.79	0.4015	4.62313	4.35
23.0437	565.59	0.1338	3.85967	3.20
24.3984	1976.37	0.2676	3.64834	11.18
26.5092	3935.39	0.1338	3.36244	22.26
28.1407	280.11	0.2676	3.17110	1.58
29.3927	17676.24	0.1004	3.03882	100.00
30.1293	852.90	0.1673	2.96618	4.83
31.9885	438.47	0.2676	2.79790	2.48
32.7637	1605.50	0.1673	2.73345	9.08
34.1154	1940.85	0.1673	2.62818	10.98
35.4989	4352.33	0.3011	2.52886	24.62
35.9864	2991.64	0.1673	2.49572	16.92
36.7606	1739.18	0.4015	2.44492	9.84
39.3864	1698.91	0.1338	2.28776	9.61
40.4955	307.20	0.2007	2.22763	1.74
41.5214	185.89	0.8029	2.17492	1.05
43.1288	2424.87	0.1338	2.09752	13.72
44.9115	1055.61	0.1338	2.01832	5.97
45.8292	265.21	0.2676	1.98002	1.50
47.4778	3064.73	0.1004	1.91504	17.34
48.4602	2366.81	0.1673	1.87849	13.39

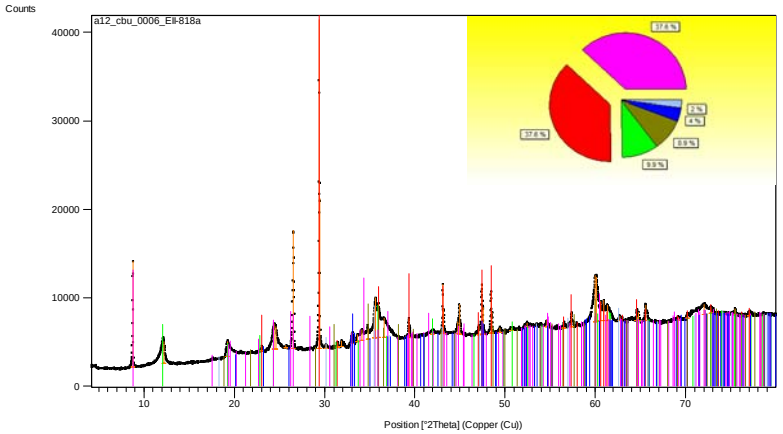
53.4451	616.25	0.3346	1.71445	3.49
54.4744	622.13	0.5353	1.68446	3.52
56.3877	964.80	0.2342	1.63176	5.46
57.4232	815.87	0.2007	1.60478	4.62
60.0682	3540.05	0.3680	1.54029	20.03
62.7083	1109.74	0.2342	1.48164	6.28
64.6698	629.26	0.2676	1.44136	3.56
65.5971	405.25	0.4015	1.42321	2.29
68.6537	367.15	0.4015	1.36712	2.08
70.8444	769.85	0.5353	1.33013	4.36
72.8106	572.87	0.4015	1.29898	3.24
74.2756	246.42	0.8160	1.27589	1.39

Pattern List:

Visible	Ref. Code	Score	Compound Name	Displacement [°2Th.]	Scale Factor
*	01-072-1937	63	Calcite	0.000	0.932
*	01-075-1210	28	Ilmenite, syn	0.000	0.116
*	01-083-0265	14	Perovskite (Ca,Fe), syn	0.000	0.079
*	01-089-6513	28	Phlogopite 1M	0.000	0.230
*	01-089-6275	28	Lizardite 1T	0.000	0.135
*	01-073-1941	33	Cobaltite	0.000	0.079
*	01-089-0950	15	Magnetite	0.000	0.075

Calonda: EII-818a

Main Graphics, Analyze View:



Peak List:

Pos. [°2Th.]	Height [cts]	FWHM [°2Th.]	d-spacing [Å]	Rel. Int. [%]
8.7669	11945.84	0.0669	10.08672	32.21
12.1994	2446.99	0.1171	7.25528	6.60
19.2688	1701.76	0.1338	4.60643	4.59
23.0365	578.13	0.1004	3.86087	1.56
24.3969	2820.84	0.2007	3.64857	7.61
24.5987	2511.02	0.1004	3.61909	6.77
25.7214	291.01	0.2007	3.46362	0.78
26.5156	13275.13	0.0502	3.36165	35.80
29.3629	37083.55	0.0612	3.03931	100.00
29.4525	17004.13	0.0408	3.03781	45.85
30.1535	380.53	0.1632	2.96141	1.03
31.4125	458.34	0.1224	2.84552	1.24
31.8743	616.16	0.1632	2.80534	1.66
33.0450	1156.51	0.1224	2.70858	3.12
33.6514	774.96	0.2856	2.66115	2.09
34.0904	1220.23	0.2448	2.62788	3.29
34.7631	1136.46	0.1632	2.57855	3.06
35.4641	3281.29	0.0612	2.52917	8.85
35.6212	4498.75	0.1020	2.51838	12.13
35.9389	3883.51	0.1428	2.49684	10.47

CHAPTER 5.
AGE AND PETROGENESIS OF KIMBERLITES IN LUNDA NORTE

APPENDIX

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Label	13b_a1_001	13b_a1_007a	13b_a1_007b	13b_a2_008	13b_a2_009	13b_a3_012	13b_a4_013	13b_b1_015a	13b_b1_015b	13b_b2_018	13b_c1_021	13b_d1_024	13b_e1_028	13b_f1_30
zone	core	core	rim	core	core	oscillatory	core	core	rim	core	core	core	core	core
Spot size	20	20	20	40	30	25	35	30	30	20	40	35	20	20
Texture	necklace	gm	gm	gm	necklace	necklace	gm	gm	gm	necklace	gm	necklace	necklace	necklace
Alteration	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Zoning	-	normal	normal	-	-	osc	normal	reverse	reverse	-	normal	-	-	-
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia
Na_2O	0.47	0.45	0.79	0.58	0.55	0.52	0.48	0.62	0.41	0.54	0.74	0.58	0.61	0.50
Al_2O_3	0.20	0.33	0.28	0.21	0.25	0.25	0.30	0.26	0.36	0.27	0.28	0.22	0.22	0.21
SiO_2	0.01	0.00	0.04	0.02	0.01	0.00	0.00	0.00	0.01	0.00	0.04	0.00	0.03	0.03
K_2O	0.02	0.02	0.04	0.02	0.00	0.00	0.02	0.01	0.03	0.00	0.00	0.02	0.02	0.00
CaO	38.52	38.35	37.43	38.63	37.91	38.67	38.77	37.92	39.29	38.40	37.71	38.39	37.95	38.63
TiO_2	56.13	55.57	55.00	56.58	55.41	56.24	55.96	55.74	55.62	55.76	55.71	56.54	56.04	55.42
FeO	1.10	1.30	1.38	1.19	1.33	1.10	1.14	1.25	1.45	1.24	1.21	1.22	1.06	1.19
SrO	0.15	0.08	0.06	0.11	0.11	0.10	0.12	0.14	0.21	0.04	0.08	0.02	0.09	0.14
Nb_2O_5	0.89	1.11	1.05	0.89	1.13	0.63	0.97	1.01	1.25	0.68	0.82	0.97	0.68	0.89
La_2O_3	0.63	0.53	0.43	0.55	0.55	0.62	0.45	0.58	0.55	0.62	0.53	0.41	0.43	0.52
Ce_2O_3	1.95	1.95	2.20	1.89	2.18	1.92	1.84	2.02	1.42	1.97	2.33	1.88	2.06	1.97
Nd_2O_5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ta_2O_5	0.27	0.05	0.63	0.29	0.09	0.29	0.16	0.04	0.18	0.02	0.14	0.04	0.15	0.00
ΣLREE	2.58	2.48	2.63	2.44	2.73	2.54	2.29	2.60	1.97	2.59	2.86	2.29	2.49	2.49
Total	100.34	99.76	99.33	100.95	99.52	100.33	100.22	99.60	100.78	99.52	99.58	100.29	99.33	99.51
Structural formula in atoms per formula unit (apfu)														
Na	0.021	0.020	0.036	0.026	0.025	0.023	0.021	0.028	0.018	0.024	0.033	0.026	0.027	0.022
Al	0.005	0.009	0.008	0.006	0.007	0.007	0.008	0.007	0.010	0.007	0.008	0.006	0.006	0.006
Si	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.001
K	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.001	0.001	0.000
Ca	0.949	0.949	0.934	0.945	0.942	0.952	0.955	0.940	0.963	0.952	0.936	0.943	0.942	0.959
Ti	0.971	0.965	0.963	0.971	0.966	0.972	0.967	0.970	0.956	0.970	0.971	0.974	0.976	0.966
Fe	0.019	0.023	0.024	0.020	0.023	0.019	0.020	0.022	0.025	0.022	0.021	0.021	0.018	0.021
Sr	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.001	0.001	0.000	0.001	0.002
Nb	0.009	0.012	0.011	0.009	0.012	0.007	0.010	0.011	0.013	0.007	0.009	0.010	0.007	0.009
La	0.005	0.005	0.004	0.005	0.005	0.005	0.004	0.005	0.005	0.005	0.005	0.003	0.004	0.004
Ce	0.016	0.016	0.019	0.016	0.019	0.016	0.015	0.017	0.012	0.017	0.020	0.016	0.017	0.017
Nd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ta	0.002	0.000	0.004	0.002	0.001	0.002	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
REE	0.022	0.021	0.022	0.020	0.023	0.021	0.019	0.022	0.017	0.022	0.024	0.019	0.021	0.021
ΔNNO	-3.90	-3.30	-2.84	-3.54	-3.18	-3.56	-3.83	-3.38	-2.88	-2.99	-3.30	-3.50	-3.77	-3.48

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Label	13b_f1_34	13b_g1_37a	13b_g1_37b	13b_g1_37c	13b_g1_37d	13c_a1_x1	13c_b1_42	13c_b1_43a	13c_b1_43b	13c_c1_45	13c_c1_46	13c_c1_49	13c_d1_51	13c_d1_54
zone	core	oscillatory	oscillatory	oscillatory	oscillatory	core	core	core	rim	core	core	core	core	core
Spot size	15	30	30	30	30	30	30	35	35	25	30	15	30	30
Texture	necklace	necklace	necklace	necklace	necklace	necklace	necklace	gm	gm	necklace	necklace	gm	necklace	necklace
Alteration	ttn	no	no	no	no	no	no	no	no	ttn	ttn	no	no	no
Zoning	-	osc	osc	osc	osc	-	-	reverse	reverse	-	-	normal	-	-
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia
Na_2O	0.38	0.62	0.62	0.45	0.27	0.75	0.63	0.53	0.27	0.41	0.47	0.56	0.53	0.47
Al_2O_3	0.38	0.21	0.22	0.22	0.33	0.28	0.25	0.30	0.47	0.29	0.30	0.32	0.28	0.24
SiO_2	0.05	0.01	0.03	0.01	0.03	0.00	0.00	0.00	0.05	0.04	0.02	0.03	0.01	0.00
K_2O	0.02	0.01	0.00	0.00	0.00	0.02	0.00	0.00	0.01	0.01	0.01	0.00	0.02	0.01
CaO	39.17	38.10	38.18	39.23	40.22	37.48	38.25	38.11	39.59	38.51	38.50	38.79	37.67	39.27
TiO_2	55.54	56.21	56.12	56.50	56.03	54.96	55.94	56.31	55.37	55.63	55.78	55.98	55.94	56.42
FeO	1.59	1.03	1.10	1.07	1.44	1.17	1.19	1.03	1.53	1.28	1.25	1.03	1.17	1.20
SrO	0.21	0.08	0.10	0.18	0.35	0.00	0.15	0.10	0.18	0.12	0.14	0.15	0.10	0.18
Nb_2O_5	0.85	0.97	0.77	0.76	0.88	1.17	0.77	0.82	0.87	0.73	0.90	0.84	0.85	0.78
La_2O_3	0.55	0.49	0.51	0.38	0.31	0.73	0.51	0.62	0.33	0.51	0.67	0.59	0.45	0.33
Ce_2O_3	1.39	1.89	1.95	1.45	0.92	2.34	1.91	1.92	1.21	1.76	1.85	1.90	1.93	1.44
Nd_2O_5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ta_2O_5	0.20	0.34	0.43	0.27	0.02	0.14	0.27	0.20	0.04	0.13	0.00	0.15	0.07	0.29
ΣLREE	1.94	2.38	2.46	1.83	1.23	3.07	2.42	2.54	1.54	2.27	2.52	2.49	2.38	1.77
Total	100.34	99.99	100.05	100.52	100.81	99.04	99.87	99.95	99.91	99.41	99.91	100.33	99.02	100.62
Structural for														
Na	0.017	0.028	0.028	0.020	0.012	0.034	0.028	0.024	0.012	0.018	0.021	0.025	0.024	0.021
Al	0.010	0.006	0.006	0.006	0.009	0.008	0.007	0.008	0.013	0.008	0.008	0.009	0.008	0.006
Si	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.000	0.000
K	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000
Ca	0.963	0.941	0.943	0.961	0.981	0.938	0.946	0.940	0.974	0.955	0.951	0.955	0.937	0.961
Ti	0.958	0.974	0.973	0.971	0.959	0.965	0.971	0.975	0.957	0.968	0.967	0.967	0.977	0.969
Fe	0.027	0.018	0.019	0.018	0.025	0.021	0.021	0.018	0.026	0.022	0.022	0.018	0.020	0.021
Sr	0.003	0.001	0.001	0.002	0.005	0.000	0.002	0.001	0.002	0.002	0.002	0.002	0.001	0.002
Nb	0.009	0.010	0.008	0.008	0.009	0.012	0.008	0.009	0.009	0.008	0.009	0.009	0.009	0.008
La	0.005	0.004	0.004	0.003	0.003	0.006	0.004	0.005	0.003	0.004	0.006	0.005	0.004	0.003
Ce	0.012	0.016	0.016	0.012	0.008	0.020	0.016	0.016	0.010	0.015	0.016	0.016	0.016	0.012
Nd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ta	0.001	0.002	0.003	0.002	0.000	0.001	0.002	0.001	0.000	0.001	0.000	0.001	0.000	0.002
REE	0.016	0.020	0.021	0.015	0.010	0.026	0.020	0.021	0.013	0.019	0.021	0.021	0.020	0.015
ΔNNO	-1.74	-4.30	-3.73	-3.88	-2.47	-3.90	-3.34	-4.10	-2.02	-2.88	-3.25	-4.14	-3.51	-3.35

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Label	13c_d2_57	13c_e1_58	13c_f1_59	13c_f1_62	13c_f1_63	13c_f1_64	13c_g1_65	13c_g1_67	13c_g1_68	13c_g1_65?	34b_a_126	34b_b_127	34b_b_128a	34b_b_128b
zone	core	core	core	core	core	core	core	core	core	core	core	core	core	rim
Spot size	20	30	30	20	15	20	20	35	35	20	25	40	35	35
Texture	gm	gm	gm	necklace	necklace	gm	gm	gm	necklace	necklace	necklace	gm	gm	gm
Alteration	no	no	ttn	ttn	ttn	ttn	ttn	no	no	no	no	no	no	no
Zoning	-	-	-	-	-	-	-	-	-	-	-	-	normal	normal
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia
Na_2O	0.67	0.65	0.60	0.49	0.44	0.72	0.63	0.57	0.66	0.57	0.60	0.82	0.76	0.42
Al_2O_3	0.23	0.24	0.23	0.22	0.29	0.33	0.21	0.21	0.22	0.19	0.28	0.28	0.21	0.26
SiO_2	0.01	0.05	0.02	0.08	0.03	0.01	0.01	0.00	0.04	0.02	0.04	0.02	0.00	0.02
K_2O	0.01	0.02	0.02	0.00	0.01	0.02	0.00	0.01	0.04	0.01	0.01	0.01	0.01	0.00
CaO	37.75	37.48	38.09	39.00	39.35	37.48	38.37	38.28	38.46	38.56	38.70	37.73	37.47	39.53
TiO_2	55.83	55.78	55.77	56.36	56.38	55.17	56.34	56.06	56.42	56.18	56.08	55.73	55.71	56.31
FeO	1.10	1.04	1.15	1.17	1.45	1.22	1.24	1.09	1.23	1.21	1.16	1.19	1.20	1.19
SrO	0.06	0.10	0.12	0.10	0.15	0.05	0.09	0.15	0.08	0.10	0.12	0.08	0.03	0.15
Nb_2O_5	0.68	0.98	0.68	0.76	0.59	1.38	0.99	0.77	0.82	0.77	0.75	1.17	1.03	0.85
La_2O_3	0.44	0.52	0.71	0.56	0.40	0.55	0.45	0.53	0.54	0.56	0.63	0.61	0.59	0.35
Ce_2O_3	2.09	2.07	2.02	1.66	1.45	2.33	1.95	1.78	1.93	1.80	1.74	1.98	2.29	1.46
Nd_2O_5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ta_2O_5	0.25	0.38	0.22	0.04	0.18	0.00	0.20	0.09	0.18	0.20	0.24	0.31	0.34	0.00
ΣLREE	2.53	2.59	2.73	2.22	1.85	2.88	2.40	2.31	2.47	2.36	2.37	2.59	2.88	1.81
Total	99.12	99.32	99.61	100.45	100.73	99.24	100.47	99.55	100.63	100.15	100.35	99.91	99.65	100.55
Structural for														
Na	0.030	0.029	0.027	0.022	0.019	0.032	0.028	0.026	0.029	0.025	0.027	0.037	0.034	0.019
Al	0.006	0.007	0.006	0.006	0.008	0.009	0.006	0.006	0.006	0.005	0.008	0.008	0.006	0.007
Si	0.000	0.001	0.000	0.002	0.001	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000
K	0.000	0.001	0.001	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
Ca	0.940	0.932	0.945	0.956	0.962	0.934	0.942	0.948	0.943	0.950	0.952	0.933	0.931	0.967
Ti	0.976	0.974	0.971	0.970	0.967	0.965	0.971	0.975	0.971	0.971	0.968	0.968	0.971	0.967
Fe	0.019	0.018	0.020	0.020	0.025	0.021	0.021	0.019	0.021	0.021	0.020	0.021	0.021	0.020
Sr	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.002	0.001	0.001	0.002	0.001	0.000	0.002
Nb	0.007	0.010	0.007	0.008	0.006	0.015	0.010	0.008	0.008	0.008	0.008	0.012	0.011	0.009
La	0.004	0.004	0.006	0.005	0.003	0.005	0.004	0.005	0.005	0.005	0.005	0.005	0.005	0.003
Ce	0.018	0.018	0.017	0.014	0.012	0.020	0.016	0.015	0.016	0.015	0.015	0.017	0.019	0.012
Nd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ta	0.002	0.002	0.001	0.000	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.000
REE	0.022	0.022	0.023	0.019	0.015	0.025	0.020	0.020	0.021	0.020	0.020	0.022	0.024	0.015
ΔNNO	-3.58	-4.24	-3.38	-3.44	-2.04	-3.98	-3.44	-3.77	-3.26	-3.27	-3.46	-3.86	-3.62	-3.48

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Mulepe 1
Label	34b_b_129	34b_c1_135	34b_c1_136	34b_c1_137	34b_c1_138	34b_f_144_1	34b_f_144_2	34b_f_145	34b_g_146	34b_g_147	34b_h_149	34b_h_152	34b_i_154	705-2d_a1_001
zone	core	core	core	core	core	core	rim	core	core	core	core	core	core	core
Spot size	20	10	25	20	25	30	25	25	20	50	15	30	20	15
Texture	gm	necklace	necklace	necklace	necklace	necklace	necklace	necklace	necklace	necklace	necklace	necklace	necklace	necklace
Alteration	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Zoning	-	-	-	-	-	-	-	-	normal	normal	-	-	-	-
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia
Na_2O	0.67	0.37	0.72	0.68	0.66	0.68	0.52	0.57	0.65	0.70	0.69	0.48	0.62	0.74
Al_2O_3	0.19	0.22	0.25	0.22	0.25	0.25	0.26	0.26	0.22	0.25	0.22	0.22	0.25	0.10
SiO_2	0.04	0.03	0.00	0.00	0.02	0.01	0.02	0.00	0.01	0.02	0.00	0.01	0.01	0.06
K_2O	0.00	0.00	0.01	0.02	0.05	0.03	0.02	0.00	0.02	0.03	0.01	0.00	0.03	-
CaO	38.09	38.47	37.84	38.26	38.17	38.01	38.44	38.87	38.22	37.68	38.17	39.25	38.36	36.39
TiO_2	56.15	56.00	56.07	56.15	56.17	55.67	55.93	55.70	55.47	55.58	55.79	55.94	55.70	55.59
FeO	1.08	1.30	1.25	1.18	1.20	1.18	1.09	1.28	1.06	1.09	1.06	1.06	1.22	1.60
SrO	0.10	0.17	0.09	0.13	0.06	0.10	0.10	0.18	0.13	0.12	0.09	0.20	0.12	0.09
Nb_2O_5	0.85	0.78	0.82	0.71	0.78	0.87	0.84	1.08	0.78	0.77	0.80	0.49	0.75	1.45
La_2O_3	0.68	0.59	0.55	0.50	0.58	0.45	0.55	0.43	0.48	0.45	0.44	0.53	0.57	0.35
Ce_2O_3	2.04	1.84	2.10	1.92	2.12	2.00	1.90	1.67	2.10	2.14	2.14	1.60	1.99	1.92
Nd_2O_5	-	-	-	-	-	-	-	-	-	-	-	-	-	0.50
Ta_2O_5	0.13	0.22	0.25	0.24	0.16	0.22	0.29	0.09	0.36	0.36	0.31	0.25	0.43	0.37
ΣLREE	2.72	2.43	2.65	2.42	2.70	2.45	2.45	2.10	2.58	2.59	2.58	2.13	2.56	2.77
Total	100.01	99.99	99.96	100.01	100.22	99.45	99.94	100.14	99.50	99.19	99.73	100.04	100.05	99.12
Structural for														
Na	0.030	0.017	0.032	0.030	0.029	0.031	0.023	0.025	0.029	0.032	0.031	0.021	0.028	0.033
Al	0.005	0.006	0.007	0.006	0.007	0.007	0.007	0.007	0.006	0.007	0.006	0.006	0.007	0.003
Si	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
K	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.000	0.000	0.001	0.000
Ca	0.941	0.950	0.935	0.944	0.941	0.944	0.950	0.958	0.951	0.939	0.946	0.968	0.949	0.908
Ti	0.973	0.970	0.973	0.973	0.972	0.970	0.970	0.964	0.968	0.972	0.971	0.969	0.967	0.973
Fe	0.019	0.023	0.022	0.020	0.021	0.021	0.019	0.022	0.019	0.019	0.018	0.018	0.021	0.028
Sr	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.003	0.002	0.001
Nb	0.009	0.008	0.009	0.007	0.008	0.009	0.009	0.011	0.008	0.008	0.008	0.005	0.008	0.015
La	0.006	0.005	0.005	0.004	0.005	0.004	0.005	0.004	0.004	0.004	0.004	0.005	0.005	0.003
Ce	0.017	0.016	0.018	0.016	0.018	0.017	0.016	0.014	0.018	0.018	0.018	0.013	0.017	0.016
Nd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
Ta	0.001	0.001	0.002	0.002	0.001	0.001	0.002	0.001	0.002	0.002	0.002	0.002	0.003	0.002
REE	0.023	0.021	0.022	0.020	0.023	0.021	0.021	0.018	0.022	0.022	0.022	0.018	0.022	0.024
ΔNNO	-3.92	-2.88	-3.14	-3.31	-3.32	-3.50	-3.87	-3.36	-3.89	-3.74	-3.93	-3.55	-3.18	-2.40

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1
Label	705-2d_a1_003	705-2d_a1_004	705-2d_a1_005	705-2d_a1_006a	705-2d_a1_006b	705-2d_a2_008	705-2d_a2_009	705-2d_a2_011	705-2d_b1_014	705-2d_b1_015	705-2d_b1_016	705-2d_c1_017	705-2d_c1_018	705-2d_c1_021
zone	core	core	core	core	rim	core	core	core	core	core	core	core	core	core
Spot size	15	20	15	10	10	10	15	12	20	15	25	20	20	15
Texture	necklace	gm	gm	necklace	necklace	necklace	gm	gm	gm	gm	gm	gm	gm	necklace
Alteration	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Zoning	-	-	-	normal	normal	-	-	-	-	-	-	-	-	-
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia
Na_2O	0.68	0.59	0.52	0.70	0.39	0.74	0.59	0.85	0.60	0.69	0.78	0.84	0.59	0.63
Al_2O_3	0.09	0.09	0.09	0.08	0.10	0.11	0.08	0.10	0.09	0.12	0.09	0.14	0.08	0.08
SiO_2	0.29	0.04	0.06	0.06	0.05	0.08	0.04	0.06	0.02	0.04	0.03	0.11	0.00	0.09
K_2O	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CaO	36.93	37.54	38.23	35.85	39.33	37.34	37.75	36.80	37.39	37.00	36.74	36.31	37.22	37.29
TiO_2	55.09	56.55	56.62	55.25	56.82	55.86	56.55	55.11	55.93	56.15	55.26	54.74	55.90	56.39
FeO	1.93	1.65	1.48	1.59	1.43	1.55	1.55	1.64	1.47	1.49	1.46	1.58	1.59	1.70
SrO	0.11	0.21	0.20	0.07	0.24	0.15	0.16	0.07	0.16	0.09	0.10	0.03	0.12	0.21
Nb_2O_5	1.18	0.93	0.69	1.23	0.69	1.23	1.00	1.28	1.07	1.20	1.21	1.23	1.06	0.83
La_2O_3	0.42	0.26	0.28	0.68	0.14	0.50	0.19	0.51	0.37	0.54	0.46	0.66	0.38	0.51
Ce_2O_3	1.84	1.42	1.07	2.43	0.61	1.77	1.41	2.02	1.60	1.93	2.24	2.22	1.85	1.66
Nd_2O_5	0.69	0.00	0.45	0.87	0.34	0.32	0.31	0.94	0.71	0.56	0.91	1.07	0.51	0.61
Ta_2O_5	0.16	0.00	0.23	0.32	0.08	0.17	0.03	0.37	0.03	0.19	0.31	0.58	0.19	0.35
ΣLREE	2.95	1.68	1.80	3.98	1.09	2.59	1.91	3.47	2.68	3.03	3.61	3.95	2.74	2.78
Total	99.41	99.29	99.89	99.14	100.20	99.83	99.67	99.73	99.42	99.99	99.59	99.52	99.48	100.35
Structural for														
Na	0.031	0.026	0.023	0.032	0.017	0.033	0.026	0.038	0.027	0.031	0.035	0.038	0.027	0.028
Al	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.003	0.002	0.003	0.002	0.004	0.002	0.002
Si	0.007	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.000	0.001	0.001	0.003	0.000	0.002
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ca	0.919	0.928	0.941	0.900	0.962	0.924	0.931	0.918	0.929	0.915	0.918	0.910	0.925	0.919
Ti	0.963	0.981	0.978	0.973	0.975	0.970	0.979	0.964	0.975	0.975	0.969	0.963	0.975	0.975
Fe	0.034	0.029	0.026	0.028	0.025	0.027	0.027	0.029	0.026	0.026	0.026	0.028	0.028	0.029
Sr	0.001	0.003	0.003	0.001	0.003	0.002	0.002	0.001	0.002	0.001	0.001	0.000	0.002	0.003
Nb	0.012	0.010	0.007	0.013	0.007	0.013	0.010	0.013	0.011	0.013	0.013	0.013	0.011	0.009
La	0.004	0.002	0.002	0.006	0.001	0.004	0.002	0.004	0.003	0.005	0.004	0.006	0.003	0.004
Ce	0.016	0.012	0.009	0.021	0.005	0.015	0.012	0.017	0.014	0.016	0.019	0.019	0.016	0.014
Nd	0.006	0.000	0.004	0.007	0.003	0.003	0.003	0.008	0.006	0.005	0.008	0.009	0.004	0.005
Ta	0.001	0.000	0.001	0.002	0.000	0.001	0.000	0.002	0.000	0.001	0.002	0.004	0.001	0.002
REE	0.025	0.014	0.015	0.034	0.009	0.022	0.016	0.029	0.023	0.026	0.031	0.034	0.023	0.023
ΔNNO	-0.61	-1.55	-2.00	-2.12	-2.25	-2.37	-2.09	-2.00	-2.49	-2.59	-2.69	-2.17	-1.95	-1.22

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1
Label	705-2d_c1_023	705-2d_c1_024	705-2d_d1_025	705-2d_d1_025b	705-2d_d1_026	705-2d_e1_027a	705-2d_e1_027b	705-2d_e1_028	705-2d_e1_029	705-2d_e1_030	706-2_a1_002	706-2_a1_005	706-2_b1_008	706-2_b1_011
zone	core	core	core	rim	core	core	rim	core	core	core	core	core	core	core
Spot size	15	20	27	27	15	20	20	15	25	15	15	10	15	15
Texture	gm	gm	gm	gm	gm	necklace	necklace	necklace	necklace	necklace	gm	necklace	gm	gm
Alteration	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Zoning	normal	-	normal	normal	-	normal	normal	normal	-	-	-	-	normal	-
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia
Na_2O	0.66	0.66	0.86	0.35	0.74	0.87	0.52	0.64	0.70	0.66	0.43	0.65	0.67	0.61
Al_2O_3	0.09	0.09	0.12	0.13	0.12	0.16	0.07	0.08	0.12	0.10	0.07	0.16	0.09	0.09
SiO_2	0.01	0.03	0.06	0.05	0.06	0.04	0.07	0.04	0.05	0.06	0.04	0.11	0.06	0.02
K_2O	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CaO	37.24	36.43	35.84	39.46	36.75	34.95	37.84	37.65	37.07	36.99	38.61	36.12	37.12	37.50
TiO_2	56.13	55.69	55.11	57.34	55.60	54.92	56.74	56.25	55.24	55.89	57.45	54.52	56.10	56.15
FeO	1.68	1.72	1.66	1.59	1.53	1.64	1.35	1.47	1.52	1.60	1.38	4.05	1.38	1.62
SrO	0.14	0.05	0.12	0.20	0.05	0.09	0.29	0.14	0.05	0.15	0.24	0.13	0.11	0.14
Nb_2O_5	1.12	1.21	1.33	0.70	1.16	1.25	0.74	1.07	1.50	1.02	0.95	0.95	1.11	0.83
La_2O_3	0.42	0.49	0.67	0.24	0.47	0.88	0.41	0.42	0.50	0.43	0.21	0.63	0.34	0.32
Ce_2O_3	1.81	1.77	2.63	0.68	1.96	3.13	1.19	1.60	1.91	1.56	1.14	2.08	1.88	1.53
Nd_2O_5	0.70	0.77	0.92	0.04	0.60	1.00	0.51	0.34	1.17	0.69	0.24	0.81	1.00	0.59
Ta_2O_5	0.24	0.31	0.45	0.07	0.44	0.23	0.00	0.04	0.44	0.25	0.00	0.27	0.31	0.10
ΣLREE	2.93	3.03	4.22	0.96	3.03	5.01	2.11	2.36	3.58	2.68	1.59	3.52	3.22	2.44
Total	100.23	99.22	99.79	100.85	99.47	99.16	99.72	99.74	100.26	99.39	100.77	100.47	100.16	99.52
Structural for														
Na	0.029	0.030	0.039	0.015	0.033	0.040	0.023	0.029	0.031	0.030	0.019	0.029	0.030	0.027
Al	0.002	0.002	0.003	0.003	0.003	0.004	0.002	0.002	0.003	0.003	0.002	0.004	0.002	0.002
Si	0.000	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.003	0.001	0.000
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ca	0.920	0.909	0.896	0.957	0.915	0.881	0.933	0.931	0.920	0.919	0.940	0.895	0.918	0.930
Ti	0.973	0.975	0.967	0.977	0.972	0.972	0.982	0.976	0.962	0.975	0.982	0.949	0.974	0.977
Fe	0.029	0.030	0.029	0.027	0.027	0.029	0.023	0.026	0.027	0.028	0.024	0.071	0.024	0.028
Sr	0.002	0.001	0.002	0.003	0.001	0.001	0.004	0.002	0.001	0.002	0.003	0.002	0.001	0.002
Nb	0.012	0.013	0.014	0.007	0.012	0.013	0.008	0.011	0.016	0.011	0.010	0.010	0.012	0.009
La	0.004	0.004	0.006	0.002	0.004	0.008	0.003	0.004	0.004	0.004	0.002	0.005	0.003	0.003
Ce	0.015	0.015	0.022	0.006	0.017	0.027	0.010	0.014	0.016	0.013	0.009	0.018	0.016	0.013
Nd	0.006	0.006	0.008	0.000	0.005	0.008	0.004	0.003	0.010	0.006	0.002	0.007	0.008	0.005
Ta	0.002	0.002	0.003	0.000	0.003	0.001	0.000	0.000	0.003	0.002	0.000	0.002	0.002	0.001
REE	0.025	0.026	0.036	0.008	0.026	0.043	0.018	0.020	0.030	0.023	0.013	0.030	0.027	0.021
ΔNNO	-1.67	-1.56	-1.96	-1.62	-2.33	-1.90	-2.62	-2.52	-2.84	-1.85	-2.82	8.89	-2.95	-1.53

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1
Label	706-2_c1_012	706-2_d1_014	706-2_d1_015	706-2_d2_019	707-1_a1_002	707-1_a1_005	707-1_a1_007	707-1_a2_008	707-1_b1_010	707-1_b1_013	707-1_b1_015	707-1_b2_017	707-1_b2_018	707-1_c1_019
zone	core	core	core	core	core	core	core	core	core	core	core	core	core	core
Spot size	20	15	15	25	20	15	15	20	15	20	20	30	25	20
Texture	gm	gm	gm	necklace	gm	gm	gm	gm	necklace	gm	gm	gm	gm	gm
Alteration	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Zoning	-	normal	normal	normal	-	-	-	-	-	-	-	-	-	-
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia
Na_2O	0.49	0.80	0.78	0.68	0.85	0.56	0.62	0.68	0.71	0.83	0.76	0.77	0.78	0.84
Al_2O_3	0.06	0.10	0.11	0.04	0.10	0.08	0.11	0.11	0.10	0.10	0.14	0.13	0.07	0.11
SiO_2	0.05	0.01	0.07	0.04	0.01	0.05	0.02	0.02	0.05	0.05	0.06	0.04	0.01	0.00
K_2O	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CaO	38.85	36.61	37.05	37.40	37.87	39.75	38.48	38.20	37.93	37.61	37.19	36.99	37.24	37.17
TiO_2	57.15	54.91	55.40	56.15	54.66	56.41	56.05	55.16	55.44	54.69	54.38	54.86	54.63	54.67
FeO	1.33	1.92	1.63	1.53	1.74	1.33	1.33	1.62	1.50	1.62	1.62	1.61	1.55	1.69
SrO	0.20	0.00	0.09	0.16	0.01	0.13	0.12	0.13	0.04	0.01	0.03	0.05	0.07	0.00
Nb_2O_5	0.89	1.59	1.38	1.21	1.35	0.80	0.83	1.14	1.02	1.10	1.40	1.69	1.52	1.17
La_2O_3	0.30	0.61	0.52	0.43	0.46	0.23	0.30	0.42	0.60	0.51	0.54	0.55	0.49	0.44
Ce_2O_3	0.93	2.14	2.02	1.85	2.03	1.09	1.51	1.99	1.90	2.19	2.11	2.20	2.07	2.06
Nd_2O_5	0.14	0.94	0.70	0.63	0.64	0.12	0.42	0.95	0.66	0.77	0.83	0.67	0.88	1.01
Ta_2O_5	0.05	0.28	0.22	0.24	0.26	0.00	0.10	0.29	0.27	0.32	0.39	0.29	0.30	0.48
ΣLREE	1.37	3.69	3.24	2.91	3.13	1.44	2.23	3.36	3.16	3.47	3.48	3.42	3.44	3.51
Total	100.42	99.91	99.98	100.37	99.98	100.55	99.87	100.70	100.21	99.80	99.43	99.84	99.62	99.64
Structural for														
Na	0.022	0.036	0.035	0.030	0.038	0.025	0.028	0.030	0.032	0.037	0.034	0.035	0.035	0.038
Al	0.002	0.003	0.003	0.001	0.003	0.002	0.003	0.003	0.003	0.003	0.004	0.004	0.002	0.003
Si	0.001	0.000	0.002	0.001	0.000	0.001	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ca	0.948	0.913	0.920	0.923	0.942	0.972	0.950	0.944	0.939	0.938	0.931	0.922	0.931	0.930
Ti	0.979	0.961	0.965	0.972	0.955	0.968	0.971	0.957	0.964	0.958	0.956	0.959	0.959	0.960
Fe	0.023	0.034	0.028	0.027	0.030	0.023	0.023	0.028	0.026	0.028	0.028	0.028	0.027	0.030
Sr	0.003	0.000	0.001	0.002	0.000	0.002	0.002	0.002	0.001	0.000	0.000	0.001	0.001	0.000
Nb	0.009	0.017	0.014	0.013	0.014	0.008	0.009	0.012	0.011	0.012	0.015	0.018	0.016	0.012
La	0.003	0.005	0.004	0.004	0.004	0.002	0.003	0.004	0.005	0.004	0.005	0.005	0.004	0.004
Ce	0.008	0.018	0.017	0.016	0.017	0.009	0.013	0.017	0.016	0.019	0.018	0.019	0.018	0.018
Nd	0.001	0.008	0.006	0.005	0.005	0.001	0.003	0.008	0.005	0.006	0.007	0.006	0.007	0.008
Ta	0.000	0.002	0.001	0.002	0.002	0.000	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.003
REE	0.011	0.031	0.027	0.024	0.027	0.012	0.019	0.028	0.027	0.029	0.030	0.029	0.029	0.030
ΔNNO	-2.95	-1.19	-2.20	-2.45	-1.67	-2.82	-2.81	-1.95	-2.31	-1.85	-2.23	-2.68	-2.70	-1.62

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1
Label	707-1_c1_020	707-1_c1_021	707-1_c1_022	707-1_c1_023	707-1_c2_025	707-1_d1_027	707-1_d1_028	707-1_d1_029	707-1_d2_030	707-1_e1_032	707-1_e1_033	707-1_f1_035	707-1_f1_037	707-1_f1_038
zone	core	core	core	core	core	core	core	core	core	core	core	core	core	core
Spot size	20	20	15	25	15	30	25	20	15	30	15	25	25	15
Texture	gm	gm	necklace	necklace	gm	gm	gm	gm	gm	gm	gm	gm	gm	necklace
Alteration	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Zoning	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia
Na_2O	0.80	0.66	0.57	0.75	0.60	0.56	0.78	0.52	0.83	0.77	0.77	0.82	0.69	0.76
Al_2O_3	0.13	0.09	0.09	0.12	0.11	0.08	0.17	0.10	0.13	0.11	0.08	0.12	0.10	0.09
SiO_2	0.04	0.04	0.04	0.02	0.03	0.03	0.16	0.03	0.04	0.02	0.02	0.04	0.03	0.03
K_2O	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CaO	36.86	37.50	38.23	37.51	38.89	39.06	37.29	38.32	36.89	37.21	37.32	37.00	37.16	37.63
TiO_2	54.84	54.53	56.01	55.16	55.91	55.93	54.83	55.71	54.83	54.76	55.17	54.90	54.68	55.08
FeO	1.67	1.53	1.43	1.56	1.35	1.09	1.55	1.46	1.71	1.49	1.44	1.60	1.42	1.42
SrO	0.00	0.00	0.16	0.10	0.15	0.22	0.00	0.18	0.04	0.00	0.12	0.05	0.12	0.05
Nb_2O_5	1.25	1.37	0.84	1.41	0.76	0.77	1.31	0.99	1.15	1.26	1.28	1.57	1.23	0.97
La_2O_3	0.48	0.43	0.49	0.42	0.36	0.41	0.44	0.47	0.59	0.48	0.48	0.49	0.50	0.50
Ce_2O_3	2.13	2.16	1.79	2.01	1.62	1.53	2.12	1.73	2.28	2.09	2.08	2.08	2.03	1.92
Nd_2O_5	1.24	1.07	0.27	0.97	0.62	0.82	0.89	0.53	0.87	0.67	0.89	0.80	0.93	0.52
Ta_2O_5	0.31	0.41	0.33	0.27	0.14	0.15	0.47	0.29	0.47	0.49	0.31	0.23	0.38	0.28
ΣLREE	3.85	3.66	2.55	3.40	2.60	2.76	3.45	2.73	3.74	3.24	3.45	3.37	3.46	2.94
Total	99.74	99.77	100.24	100.32	100.54	100.64	100.03	100.33	99.83	99.37	99.96	99.69	99.26	99.25
Structural for														
Na	0.036	0.030	0.025	0.034	0.027	0.025	0.035	0.023	0.038	0.035	0.035	0.037	0.031	0.034
Al	0.004	0.002	0.002	0.003	0.003	0.002	0.005	0.003	0.004	0.003	0.002	0.003	0.003	0.002
Si	0.001	0.001	0.001	0.000	0.001	0.001	0.004	0.001	0.001	0.000	0.000	0.001	0.001	0.001
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ca	0.921	0.937	0.943	0.930	0.957	0.962	0.927	0.946	0.921	0.931	0.929	0.923	0.932	0.940
Ti	0.962	0.956	0.970	0.960	0.966	0.967	0.957	0.966	0.961	0.962	0.964	0.961	0.962	0.966
Fe	0.029	0.027	0.025	0.027	0.023	0.019	0.027	0.025	0.030	0.026	0.025	0.028	0.025	0.025
Sr	0.000	0.000	0.002	0.001	0.002	0.003	0.000	0.002	0.001	0.000	0.002	0.001	0.002	0.001
Nb	0.013	0.014	0.009	0.015	0.008	0.008	0.014	0.010	0.012	0.013	0.013	0.017	0.013	0.010
La	0.004	0.004	0.004	0.004	0.003	0.003	0.004	0.004	0.005	0.004	0.004	0.004	0.004	0.004
Ce	0.018	0.018	0.015	0.017	0.014	0.013	0.018	0.015	0.019	0.018	0.018	0.018	0.017	0.016
Nd	0.010	0.009	0.002	0.008	0.005	0.007	0.007	0.004	0.007	0.006	0.007	0.007	0.008	0.004
Ta	0.002	0.003	0.002	0.002	0.001	0.001	0.003	0.002	0.003	0.003	0.002	0.001	0.002	0.002
REE	0.033	0.031	0.021	0.029	0.022	0.023	0.029	0.023	0.032	0.028	0.029	0.029	0.029	0.025
ΔNNO	-1.82	-2.59	-2.40	-2.55	-2.65	-3.79	-2.45	-2.46	-1.52	-2.62	-2.89	-2.56	-2.87	-2.55

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1
Label	707-1_f1_040a	707-1_f1_040b	707-1_f1_041	707-1_g1_046	707-1_g2_048	707-1_g2_049	708-2-a2-002	708-2-a2-004	708-2-a2-005b	708-2-a2-006b	708-2-a2-007a	708-2-a2-007b	708-2-a2-008	708-2-b1-011
zone	core	rim	core	core	core	core	core	core	rim	rim	core	rim	core	oscillatory
Spot size	20	20	25	20	15	15	20	10	15	10	10	10	15	15
Texture	necklace	necklace	gm	necklace	necklace	gm	necklace	necklace	gm	gm	gm	gm	gm	gm
Alteration	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Zoning	normal	normal	-	-	-	-	-	-	normal	normal	normal	normal	-	osc
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia
Na_2O	0.77	0.30	0.75	0.77	0.69	0.38	0.70	0.64	0.37	0.57	0.85	0.40	0.70	0.70
Al_2O_3	0.15	0.11	0.11	0.13	0.14	0.06	0.09	0.11	0.09	0.09	0.05	0.04	0.12	0.11
SiO_2	0.00	0.08	0.00	0.03	0.00	0.01	0.05	0.01	0.05	0.06	0.07	0.08	0.03	0.02
K_2O	-	-	-	-	-	-	0.02	0.03	0.00	0.04	0.02	0.03	0.03	0.01
CaO	36.92	39.66	37.89	37.33	37.78	39.56	37.89	37.39	40.10	38.91	37.08	39.45	37.93	37.90
TiO_2	54.50	56.78	55.32	54.97	55.55	56.32	55.66	55.01	56.99	56.53	55.04	56.84	55.43	55.11
FeO	1.63	1.25	1.64	1.64	1.46	1.37	1.40	1.36	1.07	1.21	1.67	1.48	1.51	1.52
SrO	0.02	0.16	0.12	0.07	0.05	0.25	0.10	0.07	0.23	0.18	0.04	0.20	0.10	0.07
Nb_2O_5	1.21	0.60	0.68	1.50	1.03	0.85	0.82	1.50	0.61	0.94	1.26	0.78	1.36	1.29
La_2O_3	0.54	0.24	0.60	0.46	0.42	0.24	0.39	0.43	0.17	0.46	0.64	0.23	0.60	0.55
Ce_2O_3	2.20	0.84	2.02	2.02	1.88	0.94	1.97	2.08	0.90	1.49	2.11	0.89	1.99	1.89
Nd_2O_5	0.92	0.07	0.85	0.97	1.04	0.20	-	-	-	-	-	-	-	-
Ta_2O_5	0.24	0.00	0.25	0.00	0.38	0.29	0.16	0.43	0.25	0.00	0.29	0.11	0.09	0.40
ΣLREE	3.66	1.15	3.47	3.45	3.34	1.38	2.36	2.51	1.07	1.95	2.75	1.12	2.59	2.44
Total	99.09	100.08	100.24	99.89	100.43	100.47	99.25	99.05	100.83	100.46	99.13	100.53	99.89	99.57
Structural for														
Na	0.035	0.013	0.034	0.035	0.031	0.017	0.032	0.029	0.016	0.025	0.038	0.018	0.031	0.032
Al	0.004	0.003	0.003	0.004	0.004	0.002	0.002	0.003	0.002	0.002	0.001	0.001	0.003	0.003
Si	0.000	0.002	0.000	0.001	0.000	0.000	0.001	0.000	0.001	0.001	0.002	0.002	0.001	0.000
K	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.000
Ca	0.928	0.971	0.941	0.929	0.935	0.969	0.942	0.935	0.976	0.953	0.927	0.962	0.940	0.943
Ti	0.961	0.975	0.964	0.960	0.965	0.969	0.972	0.965	0.973	0.972	0.965	0.973	0.964	0.962
Fe	0.029	0.021	0.029	0.029	0.025	0.024	0.024	0.024	0.018	0.021	0.029	0.025	0.026	0.027
Sr	0.000	0.002	0.002	0.001	0.001	0.003	0.001	0.001	0.003	0.002	0.001	0.003	0.001	0.001
Nb	0.013	0.006	0.007	0.016	0.011	0.009	0.009	0.016	0.006	0.010	0.013	0.008	0.014	0.014
La	0.005	0.002	0.005	0.004	0.004	0.002	0.003	0.004	0.001	0.004	0.006	0.002	0.005	0.005
Ce	0.019	0.007	0.017	0.017	0.016	0.008	0.017	0.018	0.007	0.012	0.018	0.007	0.017	0.016
Nd	0.008	0.001	0.007	0.008	0.009	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ta	0.002	0.000	0.002	0.000	0.002	0.002	0.001	0.003	0.002	0.000	0.002	0.001	0.001	0.003
REE	0.031	0.010	0.029	0.029	0.028	0.012	0.020	0.021	0.009	0.016	0.024	0.009	0.022	0.021
ΔNNO	-1.91	-2.90	-1.24	-2.30	-2.50	-2.70	-2.46	-3.51	-3.71	-3.51	-1.83	-2.16	-2.71	-2.55

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1
Label	708-2-b2-012	708-2-c1-013	708-2-d1-018	708-2-g1-019	706-2_a1_007	706-2_d1_018a	706-2_d1_018b	706-2_d1_018c	706-2_d2_023a	706-2_d2_023b	706-2_a1_003	706-2_d1_017	707-1_a1_001	707-1_a1_003
zone	oscillatory	core	core	core	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	core	core	core	core
Spot size	25	25	15	15	5	15	15	15	20	20	30	20	25	15
Texture	gm	gm	gm	gm	necklace	euhedral	euhedral	euhedral	gm	gm	reaction rim	reaction rim	reaction rim	reaction rim
Alteration	no	no	no	no	no	TiO?	TiO?	TiO?	no	no	no	no	no	no
Zoning	osc	normal	-	-	osc	osc	osc	osc	osc	osc	-	-	-	-
Type	Ia	Ia	Ia	Ia	Ib	Ib	Ib	Ib	Ib	Ib	IIa	IIa	IIa	IIa
Na_2O	0.71	0.69	0.71	0.74	2.44	1.09	1.13	1.10	2.22	2.01	0.64	0.85	0.70	0.64
Al_2O_3	0.11	0.09	0.15	0.11	0.03	0.15	0.11	0.06	0.06	0.06	0.08	0.07	0.09	0.06
SiO_2	0.04	0.05	0.03	0.03	0.12	0.05	0.08	0.05	0.09	0.02	0.03	0.02	0.05	0.00
K_2O	0.02	0.04	0.04	0.01	-	-	-	-	-	-	-	-	-	-
CaO	37.77	38.49	37.31	37.61	21.01	34.22	33.04	33.85	26.16	25.17	37.61	35.46	38.00	38.86
TiO_2	55.23	56.07	55.30	55.21	43.72	54.20	53.41	54.39	49.55	48.95	55.90	54.55	55.13	56.19
FeO	1.46	1.28	1.46	1.41	2.59	1.85	1.90	1.59	2.06	1.98	1.38	1.57	1.69	1.38
SrO	0.00	0.16	0.02	0.01	0.91	0.29	0.29	0.40	0.83	0.90	0.14	0.31	0.16	0.21
Nb_2O_5	1.36	1.08	1.34	1.44	7.02	0.92	1.39	0.88	2.54	2.90	1.14	1.24	1.36	0.89
La_2O_3	0.58	0.31	0.52	0.40	5.78	1.46	2.04	1.86	4.37	4.76	0.42	1.46	0.47	0.29
Ce_2O_3	2.07	1.77	2.16	2.00	13.10	4.04	4.85	4.10	9.39	10.18	1.48	3.42	1.83	1.24
Nd_2O_5	-	-	-	-	3.60	1.28	1.43	1.01	2.58	2.34	0.42	0.70	0.98	0.16
Ta_2O_5	0.43	0.33	0.11	0.25	0.00	0.08	0.38	0.12	0.00	0.31	0.14	0.27	0.22	0.06
ΣLREE	2.65	2.08	2.68	2.40	22.48	6.78	8.32	6.97	16.34	17.28	2.32	5.58	3.28	1.69
Total	99.78	100.36	99.15	99.23	100.32	99.63	100.05	99.41	99.84	99.58	99.38	99.91	100.68	99.98
Structural for														
Na	0.032	0.031	0.032	0.033	0.124	0.050	0.052	0.051	0.108	0.099	0.029	0.039	0.031	0.029
Al	0.003	0.002	0.004	0.003	0.001	0.004	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Si	0.001	0.001	0.001	0.001	0.003	0.001	0.002	0.001	0.002	0.001	0.001	0.000	0.001	0.000
K	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ca	0.938	0.947	0.930	0.937	0.589	0.868	0.844	0.862	0.703	0.683	0.934	0.893	0.939	0.957
Ti	0.963	0.968	0.968	0.965	0.860	0.965	0.957	0.972	0.934	0.933	0.974	0.964	0.956	0.971
Fe	0.025	0.022	0.026	0.025	0.051	0.033	0.034	0.028	0.039	0.038	0.024	0.028	0.029	0.024
Sr	0.000	0.002	0.000	0.000	0.014	0.004	0.004	0.006	0.012	0.013	0.002	0.004	0.002	0.003
Nb	0.014	0.011	0.014	0.015	0.083	0.010	0.015	0.009	0.029	0.033	0.012	0.013	0.014	0.009
La	0.005	0.003	0.004	0.003	0.056	0.013	0.018	0.016	0.040	0.044	0.004	0.013	0.004	0.002
Ce	0.018	0.015	0.018	0.017	0.126	0.035	0.042	0.036	0.086	0.094	0.013	0.029	0.015	0.010
Nd	0.000	0.000	0.000	0.000	0.034	0.011	0.012	0.009	0.023	0.021	0.003	0.006	0.008	0.001
Ta	0.003	0.002	0.001	0.002	0.000	0.001	0.002	0.001	0.000	0.002	0.001	0.002	0.001	0.000
REE	0.023	0.018	0.023	0.020	0.215	0.059	0.072	0.061	0.150	0.160	0.020	0.048	0.028	0.014
ΔNNO	-2.92	-3.37	-2.87	-3.22	-5.13	-0.49	-0.85	-1.57	-1.38	-2.21	-2.98	-2.20	-1.94	-2.69

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 2
Label	707-1_a1_004	707-1_a1_006	707-1_b1_011	707-1_b1_014	707-1_e1_031	707-1_f1_039	707-1_g1_042	708-2-a2-001a	708-2-a2-001b	708-2-a2-001c	708-2-b1-009	708-2-b1-009c	708-2-d1-016	723_a1_001
zone	core	core	core	core	core	core	core	core	rim	core	core	core	core	core
Spot size	20	25	15	20	20	25	10	20	20	<10	15	10	10	25
Texture	reaction rim	reaction rim	reaction rim	reaction rim	reaction rim	reaction rim	reaction rim	reaction rim	reaction rim	reaction rim	reaction rim	reaction rim	reaction rim	gm
Alteration	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Zoning	-	-	-	-	-	-	-	-	-	-	-	-	-	reverse?
Type	IIa	IIa	IIa	IIa	IIa	IIa	IIa	IIa	IIa	IIa	IIa	IIa	IIa	Ia
Na_2O	0.66	0.62	0.71	0.69	0.46	0.79	0.62	0.53	0.70	0.57	0.61	0.78	0.72	0.49
Al_2O_3	0.13	0.09	0.11	0.14	0.08	0.13	0.12	0.00	0.00	0.00	0.09	0.13	0.12	0.21
SiO_2	0.47	0.01	0.03	0.05	0.06	0.05	0.04	0.00	0.06	0.03	0.05	0.04	0.03	0.03
K_2O	-	-	-	-	-	-	-	0.01	0.00	0.02	0.00	0.03	0.00	-
CaO	36.99	38.31	38.42	37.36	39.18	36.83	38.18	39.37	38.69	39.33	39.55	37.54	37.74	38.25
TiO_2	54.32	55.88	55.54	54.99	56.64	54.38	55.37	56.97	56.31	56.63	56.77	55.21	55.01	56.06
FeO	1.96	1.49	1.50	1.60	1.10	1.79	1.54	1.18	1.16	1.25	1.22	1.55	1.51	1.26
SrO	0.22	0.07	0.08	0.06	0.16	0.08	0.14	0.18	0.15	0.18	0.20	0.00	0.05	0.07
Nb_2O_5	1.14	0.78	1.21	1.25	0.82	1.31	1.21	0.83	1.18	0.88	1.06	1.38	1.46	1.50
La_2O_3	0.40	0.33	0.51	0.48	0.22	0.42	0.53	0.15	0.26	0.25	0.16	0.51	0.56	0.27
Ce_2O_3	1.61	1.67	1.89	2.06	1.12	2.06	1.81	0.76	1.64	1.17	1.10	2.03	2.02	1.25
Nd_2O_5	0.84	0.62	0.91	0.73	0.39	0.91	0.84	-	-	-	-	-	-	0.74
Ta_2O_5	0.26	0.01	0.05	0.35	0.00	0.64	0.29	0.00	0.07	0.00	0.11	0.42	0.33	0.07
ΣLREE	2.85	2.62	3.31	3.27	1.73	3.39	3.18	0.91	1.90	1.42	1.26	2.54	2.58	2.26
Total	99.00	99.88	100.95	99.75	100.24	99.40	100.68	99.98	100.22	100.32	100.91	99.62	99.55	100.21
Structural for														
Na	0.030	0.028	0.032	0.031	0.020	0.036	0.028	0.023	0.031	0.025	0.027	0.035	0.032	0.022
Al	0.004	0.002	0.003	0.004	0.002	0.004	0.003	0.000	0.000	0.000	0.002	0.004	0.003	0.006
Si	0.011	0.000	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000
Ca	0.925	0.948	0.946	0.931	0.961	0.924	0.943	0.964	0.951	0.963	0.963	0.933	0.939	0.941
Ti	0.954	0.970	0.960	0.961	0.975	0.957	0.959	0.979	0.971	0.974	0.970	0.963	0.961	0.968
Fe	0.034	0.026	0.026	0.028	0.019	0.032	0.027	0.020	0.020	0.022	0.021	0.027	0.026	0.022
Sr	0.003	0.001	0.001	0.001	0.002	0.001	0.002	0.002	0.002	0.002	0.003	0.000	0.001	0.001
Nb	0.012	0.008	0.013	0.013	0.008	0.014	0.013	0.009	0.012	0.009	0.011	0.014	0.015	0.016
La	0.003	0.003	0.004	0.004	0.002	0.004	0.005	0.001	0.002	0.002	0.001	0.004	0.005	0.002
Ce	0.014	0.014	0.016	0.018	0.009	0.018	0.015	0.006	0.014	0.010	0.009	0.017	0.017	0.011
Nd	0.007	0.005	0.007	0.006	0.003	0.008	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.006
Ta	0.002	0.000	0.000	0.002	0.000	0.004	0.002	0.000	0.000	0.000	0.001	0.003	0.002	0.000
REE	0.024	0.022	0.028	0.028	0.014	0.029	0.027	0.008	0.016	0.012	0.010	0.022	0.022	0.019
ΔNNO	-0.40	-2.04	-2.59	-2.14	-3.82	-1.35	-2.40	-3.50	-4.02	-3.26	-3.65	-2.55	-2.82	-4.00

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2
Label	723_a1_001b	723_a1_002	723_a1_003	723_a1_003b	723_a1_004	723_a1_005	723_b1_006	723_b1_007a	723_b1_007b	723_b1_009	723_c1_010	723_d1_013	723_d1_014	723_d1_017
zone	rim	core	core	rim	core	core	core	core	rim	core	core	core	core	core
Spot size	25	20	20	20	15	15	40	25	25	30	25	35	30	50
Texture	gm	necklace	necklace	necklace	necklace	necklace	gm	gm	gm	gm	gm	gm	gm	gm
Alteration	no	no	no	no	no	no	no	no	no	no	no	usp	no	no
Zoning	reverse?	-	-	-	-	-	-	reverse	reverse	reverse?	-	-	-	-
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia
Na_2O	0.40	0.54	0.50	0.20	0.47	0.62	0.38	0.60	0.67	0.71	0.69	0.66	0.45	0.44
Al_2O_3	0.16	0.17	0.17	0.23	0.15	0.17	0.20	0.17	0.06	0.08	0.19	0.18	0.20	0.18
SiO_2	0.02	0.04	0.00	0.08	0.06	0.04	0.03	0.00	0.06	0.10	0.00	0.13	0.02	0.02
K_2O	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CaO	39.06	38.34	38.01	39.45	38.27	37.74	38.98	37.27	37.62	37.74	37.41	37.06	37.76	38.13
TiO_2	57.12	56.60	56.40	56.62	56.76	55.87	57.27	54.94	53.90	54.01	54.59	53.96	56.29	56.55
FeO	1.34	1.34	1.53	1.54	1.44	1.46	1.21	1.56	1.69	1.84	1.62	1.66	1.36	1.24
SrO	0.17	0.12	0.05	0.17	0.12	0.05	0.11	0.15	0.20	0.25	0.09	0.00	0.05	0.14
Nb_2O_5	0.81	0.81	1.01	0.57	0.93	1.55	0.57	2.21	3.71	3.38	1.96	2.89	0.85	0.87
La_2O_3	0.03	0.18	0.23	0.07	0.22	0.16	0.13	0.38	0.19	0.22	0.26	0.29	0.20	0.13
Ce_2O_3	1.01	1.27	1.34	0.55	1.21	1.51	1.07	1.44	1.14	0.97	1.71	1.59	1.34	1.29
Nd_2O_5	0.42	0.40	0.82	0.32	0.75	0.58	0.66	0.55	0.54	0.03	0.78	0.66	0.54	0.63
Ta_2O_5	0.00	0.21	0.13	0.08	0.00	0.44	0.06	0.04	0.07	0.24	0.33	0.24	0.50	0.12
ΣLREE	1.46	1.85	2.39	0.94	2.18	2.25	1.86	2.37	1.87	1.22	2.75	2.54	2.08	2.05
Total	100.54	100.01	100.19	99.86	100.38	100.19	100.68	99.32	99.85	99.57	99.64	99.34	99.56	99.73
Structural for														
Na	0.018	0.024	0.022	0.009	0.021	0.028	0.017	0.027	0.030	0.032	0.031	0.030	0.020	0.020
Al	0.004	0.005	0.005	0.006	0.004	0.005	0.005	0.005	0.002	0.002	0.005	0.005	0.005	0.005
Si	0.000	0.001	0.000	0.002	0.001	0.001	0.001	0.000	0.001	0.002	0.000	0.003	0.000	0.000
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ca	0.953	0.942	0.935	0.966	0.938	0.930	0.951	0.928	0.934	0.936	0.932	0.925	0.934	0.940
Ti	0.978	0.977	0.974	0.973	0.976	0.967	0.980	0.960	0.939	0.940	0.955	0.945	0.977	0.979
Fe	0.023	0.023	0.026	0.026	0.025	0.025	0.021	0.027	0.029	0.032	0.028	0.029	0.024	0.021
Sr	0.002	0.002	0.001	0.002	0.002	0.001	0.001	0.002	0.003	0.003	0.001	0.000	0.001	0.002
Nb	0.008	0.008	0.010	0.006	0.010	0.016	0.006	0.023	0.039	0.035	0.021	0.030	0.009	0.009
La	0.000	0.002	0.002	0.001	0.002	0.001	0.001	0.003	0.002	0.002	0.002	0.002	0.002	0.001
Ce	0.008	0.011	0.011	0.005	0.010	0.013	0.009	0.012	0.010	0.008	0.015	0.014	0.011	0.011
Nd	0.003	0.003	0.007	0.003	0.006	0.005	0.005	0.005	0.004	0.000	0.006	0.005	0.004	0.005
Ta	0.000	0.001	0.001	0.000	0.000	0.003	0.000	0.000	0.000	0.002	0.002	0.002	0.003	0.001
REE	0.012	0.015	0.020	0.008	0.018	0.019	0.015	0.020	0.016	0.010	0.023	0.022	0.017	0.017
ΔNNO	-2.80	-2.77	-2.20	-1.61	-2.51	-3.20	-3.05	-3.58	-4.99	-3.91	-2.99	-4.03	-2.70	-3.26

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2
Label	723_d1_017_1	723_e1_019a	723_e1_019b	723_e1_019c	723_e1_019d	723_e1_019e	723_e1_019f	723_e1_019g	723_e1_019h	723-2_b1_005	723-2_b1_006	723-2_b1_007	723-2_c1_009	723-2_c2_012
zone	core	core	rim	core	core	core	core	core	core	core	core	core	core	core
Spot size	50	20	20	20	20	20	20	20	20	30	15	15	20	25
Texture	gm	gm	gm	gm	gm	gm	gm	gm	gm	gm	gm	necklace	gm	necklace
Alteration	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Zoning	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia
Na_2O	0.51	0.64	0.63	0.60	0.62	0.93	0.97	0.61	0.50	0.41	0.53	0.38	0.48	0.47
Al_2O_3	0.16	0.16	0.17	0.15	0.15	0.13	0.15	0.12	0.10	0.18	0.19	0.16	0.21	0.23
SiO_2	0.04	0.02	0.02	0.02	0.01	0.01	0.00	0.04	0.04	0.02	0.02	0.04	0.04	0.04
K_2O	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CaO	38.11	37.24	37.76	38.00	37.94	36.06	36.42	37.48	37.94	38.93	38.73	39.64	38.62	38.68
TiO_2	56.78	54.85	55.04	55.64	55.39	52.84	53.29	54.99	55.64	56.40	55.83	56.89	55.28	56.04
FeO	1.27	1.68	1.64	1.38	1.46	1.61	1.63	1.41	1.52	1.33	1.37	1.25	1.44	1.26
SrO	0.11	0.07	0.16	0.23	0.14	0.02	0.06	0.23	0.23	0.12	0.13	0.07	0.15	0.04
Nb_2O_5	0.75	2.43	2.57	2.24	2.37	4.65	4.53	2.51	2.30	0.62	0.86	0.55	1.68	0.82
La_2O_3	0.05	0.23	0.39	0.16	0.23	0.34	0.52	0.36	0.35	0.18	0.24	0.08	0.24	0.27
Ce_2O_3	1.21	1.55	1.47	1.46	1.28	2.00	1.81	1.44	1.18	1.15	1.21	0.86	1.40	1.41
Nd_2O_5	0.54	0.80	0.52	0.48	0.73	0.88	0.68	0.32	0.31	0.24	0.66	0.16	0.63	0.72
Ta_2O_5	0.08	0.20	0.14	0.13	0.06	0.38	0.19	0.13	0.15	0.30	0.06	0.18	0.21	0.14
ΣLREE	1.80	2.58	2.38	2.10	2.24	3.22	3.01	2.12	1.84	1.57	2.11	1.10	2.27	2.40
Total	99.60	99.90	100.51	100.50	100.37	99.84	100.27	99.63	100.26	99.88	99.81	100.26	100.37	100.11
Structural for														
Na	0.023	0.029	0.028	0.027	0.028	0.042	0.044	0.027	0.022	0.018	0.024	0.017	0.021	0.021
Al	0.004	0.004	0.005	0.004	0.004	0.004	0.004	0.003	0.003	0.005	0.005	0.004	0.006	0.006
Si	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.001
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ca	0.939	0.924	0.931	0.934	0.934	0.903	0.906	0.930	0.934	0.958	0.957	0.968	0.952	0.953
Ti	0.982	0.955	0.952	0.960	0.957	0.929	0.931	0.958	0.961	0.974	0.968	0.976	0.956	0.969
Fe	0.022	0.029	0.028	0.024	0.025	0.028	0.028	0.025	0.026	0.023	0.024	0.021	0.025	0.022
Sr	0.001	0.001	0.002	0.003	0.002	0.000	0.001	0.003	0.003	0.002	0.002	0.001	0.002	0.001
Nb	0.008	0.025	0.027	0.023	0.025	0.049	0.048	0.026	0.024	0.006	0.009	0.006	0.017	0.009
La	0.000	0.002	0.003	0.001	0.002	0.003	0.004	0.003	0.003	0.002	0.002	0.001	0.002	0.002
Ce	0.010	0.013	0.012	0.012	0.011	0.017	0.015	0.012	0.010	0.010	0.010	0.007	0.012	0.012
Nd	0.004	0.007	0.004	0.004	0.006	0.007	0.006	0.003	0.003	0.002	0.005	0.001	0.005	0.006
Ta	0.001	0.001	0.001	0.001	0.000	0.002	0.001	0.001	0.001	0.002	0.000	0.001	0.001	0.001
REE	0.015	0.022	0.020	0.018	0.019	0.027	0.025	0.018	0.015	0.013	0.018	0.009	0.019	0.020
ΔNNO	-2.98	-3.36	-3.74	-4.45	-4.27	-6.56	-6.32	-4.64	-3.92	-2.56	-2.68	-2.85	-3.45	-3.11

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2
Label	723-2_d1_015	723-2_d1_016	723-2_d2_021	723-2_d2_022a	723-2_d2_022b	723-2_e1_023	723-2_e1_024	723-2_f1_031	728-4-A1-001	728-4-a1-002	728-4-a1-003a	728-4-a1-004	728-4-a1-006a	728-4-b1-008
zone	core	core	core	core	rim	core	core	core	core	core	core	core	core	core
Spot size	20	20	15	15	15	20	20	25	15	15	30	15	30	25
Texture	gm	gm	gm	gm	gm	gm	gm	gm	necklace	necklace	gm	necklace	gm	necklace
Alteration	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Zoning	-	-	-	normal?	normal?	-	-	-	-	-	-	-	-	-
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia
Na_2O	0.36	0.53	0.79	0.84	0.64	0.57	0.46	0.40	0.40	0.38	0.55	0.37	0.46	0.45
Al_2O_3	0.17	0.19	0.17	0.19	0.12	0.24	0.13	0.19	0.32	0.16	0.21	0.18	0.14	0.17
SiO_2	0.06	0.05	0.03	0.05	0.07	0.03	0.00	0.00	0.64	0.00	0.00	0.02	0.01	0.04
K_2O	-	-	-	-	-	-	-	-	0.01	0.02	0.00	0.03	0.01	0.01
CaO	39.90	38.89	37.13	37.14	38.78	38.38	39.05	39.35	38.72	39.86	39.08	39.61	39.33	39.13
TiO_2	56.62	55.62	52.78	52.69	55.06	55.46	56.79	56.45	55.89	56.92	56.28	56.77	56.84	56.40
FeO	1.32	1.34	1.74	1.68	1.35	1.35	1.18	1.43	1.36	1.28	1.24	1.26	1.14	1.24
SrO	0.14	0.13	0.12	0.06	0.24	0.05	0.09	0.10	0.09	0.10	0.05	0.08	0.11	0.05
Nb_2O_5	0.57	1.15	3.93	4.22	2.16	1.03	0.68	0.72	0.70	0.55	0.73	0.55	0.82	0.83
La_2O_3	0.06	0.18	0.40	0.35	0.25	0.29	0.01	0.18	0.19	0.10	0.16	0.15	0.10	0.18
Ce_2O_3	0.95	1.16	1.73	1.66	1.23	1.28	1.23	1.25	1.23	0.98	1.36	1.29	1.38	1.30
Nd_2O_5	0.35	0.36	1.11	0.74	0.51	0.83	0.20	0.24	-	-	-	-	-	-
Ta_2O_5	0.17	0.27	0.28	0.39	0.19	0.18	0.11	0.17	0.09	0.29	0.16	0.05	0.29	0.18
ΣLREE	1.36	1.70	3.24	2.75	1.99	2.40	1.44	1.67	1.42	1.08	1.52	1.44	1.48	1.48
Total	100.66	99.87	100.22	100.02	100.60	99.70	99.93	100.47	99.65	100.64	99.84	100.37	100.62	99.99
Structural for														
Na	0.016	0.024	0.036	0.038	0.028	0.026	0.020	0.018	0.018	0.017	0.024	0.016	0.020	0.020
Al	0.005	0.005	0.005	0.005	0.003	0.007	0.004	0.005	0.009	0.004	0.006	0.005	0.004	0.005
Si	0.001	0.001	0.001	0.001	0.002	0.001	0.000	0.000	0.015	0.000	0.000	0.000	0.000	0.001
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000
Ca	0.973	0.960	0.927	0.927	0.954	0.951	0.959	0.963	0.950	0.971	0.962	0.968	0.960	0.961
Ti	0.970	0.963	0.925	0.923	0.951	0.965	0.978	0.970	0.962	0.974	0.972	0.974	0.974	0.972
Fe	0.023	0.023	0.031	0.029	0.023	0.023	0.020	0.025	0.023	0.022	0.021	0.022	0.020	0.021
Sr	0.002	0.002	0.002	0.001	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Nb	0.006	0.012	0.041	0.044	0.022	0.011	0.007	0.007	0.007	0.006	0.008	0.006	0.008	0.009
La	0.001	0.002	0.003	0.003	0.002	0.002	0.000	0.002	0.002	0.001	0.001	0.001	0.001	0.002
Ce	0.008	0.010	0.015	0.014	0.010	0.011	0.010	0.010	0.010	0.008	0.011	0.011	0.012	0.011
Nd	0.003	0.003	0.009	0.006	0.004	0.007	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000
Ta	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.000	0.002	0.001
REE	0.011	0.014	0.027	0.023	0.017	0.020	0.012	0.014	0.012	0.009	0.013	0.012	0.012	0.012
ΔNNO	-2.58	-3.19	-5.05	-5.69	-4.47	-2.97	-3.29	-2.28	-2.55	-2.73	-3.09	-2.80	-3.67	-3.23

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2
Label	728-4-b1-009	728-4-b1-010	728-4-b1-012	728-4-b2-014	728-4-b2-015	728-4-c1-016	728-4-c1-017	728-4-d1-018	728-4-d1-021	728-4-d1-022	728-4-d1-023	728-4-d1-025	728-4-d1-026	728-4-e1-027
zone	core	core	core	core	core	core	core	core	core	core	core	core	core	core
Spot size	20	20	15	20	15	25	20	15	20	25	15	20	20	20
Texture	necklace	necklace	necklace	necklace	necklace	necklace	necklace	necklace	necklace	necklace	necklace	gm	gm	necklace
Alteration	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Zoning	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia
Na_2O	0.44	0.54	0.55	0.42	0.43	0.49	0.43	0.36	0.44	0.46	0.44	0.43	0.43	0.50
Al_2O_3	0.26	0.18	0.14	0.22	0.18	0.21	0.20	0.20	0.14	0.20	0.17	0.18	0.20	0.18
SiO_2	0.26	0.04	0.03	0.02	0.01	0.02	0.03	0.04	0.02	0.03	0.00	0.02	0.03	0.02
K_2O	0.02	0.01	0.00	0.00	0.01	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.03	0.03
CaO	39.30	39.44	39.37	39.66	39.62	39.43	39.50	39.88	39.57	39.82	39.31	39.19	39.64	39.27
TiO_2	56.08	57.07	56.68	56.87	56.94	56.39	56.75	57.05	56.75	56.85	56.89	56.60	56.81	56.85
FeO	1.41	1.18	1.26	1.15	1.34	1.42	1.24	1.22	1.31	1.12	1.30	1.33	1.38	1.32
SrO	0.16	0.07	0.10	0.12	0.13	0.08	0.09	0.20	0.12	0.13	0.12	0.07	0.13	0.10
Nb_2O_5	0.76	0.74	0.68	0.66	0.57	0.78	0.64	0.54	0.61	0.48	0.54	0.78	0.62	0.80
La_2O_3	0.23	0.03	0.19	0.15	0.04	0.17	0.23	0.10	0.16	0.15	0.12	0.10	0.10	0.27
Ce_2O_3	1.23	1.31	1.28	1.17	1.29	1.44	1.12	1.06	1.17	1.09	1.25	1.17	1.10	1.31
Nd_2O_5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ta_2O_5	0.18	0.11	0.00	0.07	0.24	0.33	0.31	0.09	0.00	0.13	0.45	0.25	0.27	0.27
ΣLREE	1.46	1.34	1.47	1.32	1.33	1.61	1.35	1.16	1.33	1.24	1.37	1.27	1.20	1.58
Total	100.34	100.72	100.28	100.50	100.81	100.77	100.54	100.75	100.32	100.45	100.60	100.12	100.75	100.93
Structural for														
Na	0.019	0.024	0.024	0.019	0.019	0.022	0.019	0.016	0.019	0.020	0.019	0.019	0.019	0.022
Al	0.007	0.005	0.004	0.006	0.005	0.006	0.005	0.005	0.004	0.005	0.005	0.005	0.005	0.005
Si	0.006	0.001	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.000	0.000	0.001	0.000
K	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.001	0.001
Ca	0.962	0.960	0.964	0.968	0.965	0.963	0.965	0.970	0.968	0.972	0.960	0.960	0.966	0.957
Ti	0.963	0.975	0.974	0.974	0.973	0.967	0.973	0.974	0.974	0.974	0.975	0.973	0.971	0.972
Fe	0.024	0.020	0.022	0.020	0.023	0.024	0.021	0.021	0.022	0.019	0.022	0.023	0.024	0.023
Sr	0.002	0.001	0.001	0.002	0.002	0.001	0.001	0.003	0.002	0.002	0.002	0.001	0.002	0.001
Nb	0.008	0.008	0.007	0.007	0.006	0.008	0.007	0.006	0.006	0.005	0.006	0.008	0.006	0.008
La	0.002	0.000	0.002	0.001	0.000	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.002
Ce	0.010	0.011	0.011	0.010	0.011	0.012	0.009	0.009	0.010	0.009	0.010	0.010	0.009	0.011
Nd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ta	0.001	0.001	0.000	0.000	0.001	0.002	0.002	0.001	0.000	0.001	0.003	0.002	0.002	0.002
REE	0.012	0.011	0.012	0.011	0.011	0.013	0.011	0.010	0.011	0.010	0.011	0.011	0.010	0.013
ΔNNO	-2.42	-3.41	-2.96	-3.42	-2.50	-2.41	-3.01	-2.98	-2.66	-3.32	-2.62	-2.79	-2.39	-2.88

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2
Label	728-4-e1-029	728-4-e2-030	728-4-e2-031	728-4-f1-032	728-4-f1-033	728-4-f2-034	728-4-f2-036	728-4-g1-037	728-4-g1-038	728-4-h1-039	728-4-h2-041	723_c1_011a	723_c1_011b	723_c1_011c
zone	core	core	core	core	core	core	core	core	core	core	core	oscillatory	oscillatory	oscillatory
Spot size	20	20	20	15	15	15	30	30	35	25	35	10	10	10
Texture	necklace	gm	gm	necklace	necklace	gm	gm	gm	gm	necklace	gm	gm	gm	gm
Alteration	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Zoning	-	-	-	-	-	-	-	-	-	-	-	osc	osc	osc
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ib	Ib	Ib
Na_2O	0.42	0.49	0.43	0.47	0.51	0.26	0.51	0.43	0.50	0.47	0.53	0.69	1.13	0.53
Al_2O_3	0.18	0.24	0.21	0.16	0.21	0.24	0.16	0.18	0.16	0.17	0.22	0.17	0.10	0.09
SiO_2	0.03	0.10	0.02	0.04	0.03	0.05	0.04	0.00	0.07	0.02	0.00	0.05	0.10	0.08
K_2O	0.06	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.00	0.00	0.02	-	-	-
CaO	39.51	39.06	38.96	39.12	39.03	40.62	39.40	39.13	39.30	39.46	38.67	36.94	36.67	38.49
TiO_2	57.44	56.56	56.54	56.50	56.23	56.94	57.02	56.63	56.71	56.95	56.90	54.03	52.36	54.75
FeO	1.16	1.29	1.31	1.43	1.25	1.02	1.17	1.31	1.17	1.37	1.19	1.96	1.71	1.66
SrO	0.15	0.13	0.10	0.08	0.07	0.21	0.09	0.03	0.09	0.05	0.01	0.05	0.21	0.25
Nb_2O_5	0.50	0.61	0.78	0.94	0.82	0.48	0.59	0.69	0.64	0.71	0.88	3.03	5.53	3.09
La_2O_3	0.00	0.16	0.26	0.17	0.15	0.24	0.19	0.16	0.10	0.16	0.10	0.33	0.29	0.26
Ce_2O_3	0.96	1.15	1.27	1.42	1.38	0.71	1.25	1.46	1.39	1.20	1.39	1.49	1.36	1.12
Nd_2O_5	-	-	-	-	-	-	-	-	-	-	-	0.60	0.51	0.22
Ta_2O_5	0.11	0.11	0.07	0.24	0.29	0.00	0.24	0.02	0.13	0.11	0.25	0.14	0.17	0.04
ΣLREE	0.96	1.31	1.53	1.59	1.53	0.95	1.44	1.62	1.49	1.36	1.49	2.42	2.16	1.60
Total	100.52	99.91	99.98	100.58	99.99	100.78	100.67	100.06	100.25	100.69	100.17	99.49	100.15	100.58
Structural for														
Na	0.018	0.022	0.019	0.021	0.023	0.011	0.023	0.019	0.022	0.021	0.023	0.031	0.051	0.024
Al	0.005	0.006	0.006	0.004	0.006	0.006	0.004	0.005	0.004	0.005	0.006	0.005	0.003	0.002
Si	0.001	0.002	0.000	0.001	0.001	0.001	0.001	0.000	0.002	0.000	0.000	0.001	0.002	0.002
K	0.002	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
Ca	0.961	0.958	0.956	0.956	0.960	0.987	0.961	0.960	0.962	0.961	0.947	0.920	0.913	0.946
Ti	0.981	0.974	0.974	0.969	0.970	0.971	0.976	0.975	0.974	0.974	0.978	0.945	0.915	0.944
Fe	0.020	0.022	0.023	0.025	0.022	0.017	0.020	0.023	0.020	0.023	0.020	0.034	0.030	0.029
Sr	0.002	0.002	0.001	0.001	0.001	0.003	0.001	0.000	0.001	0.001	0.000	0.001	0.003	0.003
Nb	0.005	0.006	0.008	0.010	0.009	0.005	0.006	0.007	0.007	0.007	0.009	0.032	0.058	0.032
La	0.000	0.001	0.002	0.001	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.003	0.002	0.002
Ce	0.008	0.010	0.011	0.012	0.012	0.006	0.010	0.012	0.012	0.010	0.012	0.013	0.012	0.009
Nd	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.004	0.002
Ta	0.001	0.001	0.000	0.001	0.002	0.000	0.001	0.000	0.001	0.001	0.002	0.001	0.001	0.000
REE	0.008	0.011	0.013	0.013	0.013	0.008	0.012	0.014	0.012	0.011	0.012	0.021	0.018	0.013
ΔNNO	-3.19	-2.73	-2.86	-2.57	-3.17	-3.76	-3.25	-2.75	-3.30	-2.55	-3.52	-2.91	-7.29	-4.34

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2
Label	723_c1_012a	723_c1_012b	723_c1_012c	723_c1_012d	723_d1_015a	723_d1_015b	723_d1_016b	723_d1_016c	723_e1_018a	723_e1_018b	723_e1_018c	723-2_b1_008b	723-2_b1_008c	723-2_c1_010bis
zone	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory
Spot size	15	15	15	15	25	25	20	20	18	18	18	20	20	15
Texture	necklace	necklace	necklace	necklace	gm	gm	gm	gm	gm	gm	gm	gm	gm	gm
Alteration	no	no	no	no	no	no	usp	usp	no	no	no	no	no	no
Zoning	osc	osc	osc	osc	osc	osc	osc	osc	osc	osc	osc	osc	osc	osc
Type	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib
Na_2O	0.73	0.69	0.63	0.47	0.73	0.89	0.61	0.61	0.88	0.78	0.48	0.51	1.48	1.46
Al_2O_3	0.20	0.16	0.16	0.13	0.12	0.13	0.17	0.11	0.14	0.16	0.10	0.10	0.06	0.06
SiO_2	0.05	0.04	0.03	0.04	0.05	0.03	0.03	0.10	0.08	0.03	0.09	0.04	0.04	0.01
K_2O	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CaO	37.29	37.28	37.60	38.02	37.10	36.89	37.50	37.95	36.49	36.78	38.37	39.28	36.13	35.90
TiO_2	54.65	54.67	55.04	55.88	54.01	53.32	54.62	55.34	52.99	53.97	56.68	55.64	49.42	49.51
FeO	1.53	1.73	1.50	1.39	1.62	1.71	1.53	1.54	1.91	1.84	1.45	1.19	1.84	2.39
SrO	0.02	0.01	0.00	0.12	0.19	0.18	0.20	0.21	0.11	0.09	0.18	0.18	0.27	0.17
Nb_2O_5	2.49	2.54	2.25	1.72	3.26	4.18	2.49	2.48	4.40	3.25	1.27	1.38	8.27	8.80
La_2O_3	0.42	0.37	0.36	0.17	0.23	0.50	0.20	0.12	0.48	0.34	0.19	0.23	0.36	0.36
Ce_2O_3	1.61	1.68	1.71	1.37	1.58	1.62	1.54	1.18	1.73	1.66	0.98	0.93	1.50	1.28
Nd_2O_5	0.60	0.52	0.47	0.77	0.62	0.82	0.62	0.39	0.53	0.78	0.47	0.47	0.82	0.74
Ta_2O_5	0.52	0.36	0.00	0.06	0.12	0.08	0.03	0.17	0.39	0.00	0.00	0.00	0.11	0.27
ΣLREE	2.63	2.57	2.54	2.31	2.43	2.94	2.36	1.69	2.74	2.78	1.64	1.63	2.68	2.38
Total	100.10	100.06	99.74	100.14	99.62	100.36	99.52	100.19	100.13	99.68	100.27	99.95	100.31	100.96
Structural for														
Na	0.033	0.031	0.028	0.021	0.033	0.040	0.027	0.027	0.040	0.035	0.021	0.023	0.067	0.066
Al	0.005	0.004	0.004	0.004	0.003	0.004	0.005	0.003	0.004	0.004	0.003	0.003	0.002	0.002
Si	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.001	0.002	0.001	0.001	0.000
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ca	0.924	0.924	0.932	0.937	0.924	0.917	0.933	0.934	0.909	0.916	0.940	0.968	0.909	0.897
Ti	0.951	0.951	0.958	0.967	0.944	0.930	0.953	0.956	0.927	0.944	0.974	0.962	0.873	0.868
Fe	0.027	0.030	0.026	0.024	0.028	0.030	0.027	0.027	0.033	0.032	0.025	0.021	0.033	0.042
Sr	0.000	0.000	0.000	0.002	0.003	0.002	0.003	0.003	0.001	0.001	0.002	0.002	0.004	0.002
Nb	0.026	0.027	0.024	0.018	0.034	0.044	0.026	0.026	0.046	0.034	0.013	0.014	0.088	0.093
La	0.004	0.003	0.003	0.001	0.002	0.004	0.002	0.001	0.004	0.003	0.002	0.002	0.003	0.003
Ce	0.014	0.014	0.014	0.012	0.013	0.014	0.013	0.010	0.015	0.014	0.008	0.008	0.013	0.011
Nd	0.005	0.004	0.004	0.006	0.005	0.007	0.005	0.003	0.004	0.006	0.004	0.004	0.007	0.006
Ta	0.003	0.002	0.000	0.000	0.001	0.001	0.000	0.001	0.002	0.000	0.000	0.000	0.001	0.002
REE	0.022	0.022	0.021	0.019	0.021	0.025	0.020	0.014	0.023	0.024	0.014	0.014	0.023	0.020
ΔNNO	-4.10	-3.29	-3.91	-3.72	-4.70	-5.52	-4.09	-4.06	-4.93	-3.72	-2.91	-4.14	-10.35	-8.61

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2
Label	723-2_c2_014a	723-2_c2_014b	723-2_c2_014c	723-2_d1_017a	723-2_d1_017b	723-2_d1_018a	723-2_d1_018b	723-2_d1_018c	723-2_d1_018d	723-2_d1_018e	723-2_d1_019a	723-2_d1_019b	723-2_e1_025a	723-2_e1_025b
zone	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	core	rim	oscillatory	oscillatory
Spot size	20	20	20	20	20	20	20	20	20	20	20	20	no	no
Texture	gm	gm	gm	gm	gm	gm	gm	gm	gm	gm	gm	gm	gm	gm
Alteration	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Zoning	osc	osc	osc	osc	osc	osc	osc	osc	osc	osc	normal?	normal?	osc	osc
Type	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib
Na_2O	0.55	0.88	0.99	0.37	1.28	0.92	1.08	0.94	0.72	0.59	0.84	0.48	0.84	0.79
Al_2O_3	0.11	0.05	0.07	0.14	0.07	0.17	0.14	0.13	0.13	0.09	0.18	0.14	0.30	0.17
SiO_2	0.02	0.06	0.08	0.07	0.01	0.01	0.03	0.02	0.10	0.16	0.04	0.04	0.79	0.02
K_2O	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CaO	38.30	37.42	37.48	39.40	36.51	36.60	36.32	37.04	37.62	38.46	37.63	38.93	36.71	37.38
TiO_2	55.12	51.90	52.20	55.31	51.18	51.39	51.37	51.89	52.98	55.23	54.00	56.14	52.04	53.26
FeO	1.49	1.91	1.58	1.57	1.72	1.72	1.78	1.62	1.51	1.46	1.76	1.49	2.01	1.65
SrO	0.16	0.21	0.20	0.20	0.20	0.00	0.00	0.06	0.17	0.21	0.06	0.22	0.00	0.00
Nb_2O_5	2.12	5.41	5.27	2.24	6.18	5.13	5.38	5.25	3.70	2.16	2.99	1.66	2.87	2.97
La_2O_3	0.18	0.35	0.38	0.19	0.38	0.34	0.46	0.40	0.46	0.40	0.39	0.21	0.33	0.32
Ce_2O_3	1.32	1.29	1.51	1.05	1.92	1.84	2.04	1.84	1.66	1.17	1.73	1.14	1.72	1.75
Nd_2O_5	0.45	0.55	0.74	0.32	1.02	1.06	0.45	0.65	0.52	0.40	0.64	0.27	0.98	0.81
Ta_2O_5	0.02	0.14	0.11	0.08	0.21	0.23	0.47	0.31	0.19	0.00	0.33	0.10	0.70	0.29
ΣLREE	1.95	2.19	2.63	1.56	3.32	3.24	2.95	2.89	2.64	1.97	2.76	1.62	3.03	2.88
Total	99.85	100.16	100.60	100.93	100.69	99.43	99.53	100.15	99.75	100.33	100.60	100.82	99.29	99.41
Structural for														
Na	0.025	0.040	0.045	0.016	0.058	0.042	0.049	0.043	0.033	0.026	0.038	0.021	0.038	0.036
Al	0.003	0.001	0.002	0.004	0.002	0.005	0.004	0.004	0.004	0.002	0.005	0.004	0.008	0.005
Si	0.000	0.001	0.002	0.002	0.000	0.000	0.001	0.000	0.002	0.004	0.001	0.001	0.018	0.000
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ca	0.947	0.933	0.932	0.963	0.913	0.924	0.915	0.927	0.940	0.946	0.931	0.951	0.921	0.937
Ti	0.957	0.908	0.911	0.949	0.899	0.910	0.909	0.911	0.929	0.954	0.938	0.963	0.916	0.937
Fe	0.026	0.033	0.028	0.027	0.030	0.030	0.032	0.028	0.026	0.025	0.031	0.026	0.035	0.029
Sr	0.002	0.003	0.003	0.003	0.003	0.000	0.000	0.001	0.002	0.003	0.001	0.003	0.000	0.000
Nb	0.022	0.057	0.055	0.023	0.065	0.055	0.057	0.055	0.039	0.022	0.031	0.017	0.030	0.031
La	0.002	0.003	0.003	0.002	0.003	0.003	0.004	0.003	0.004	0.003	0.003	0.002	0.003	0.003
Ce	0.011	0.011	0.013	0.009	0.016	0.016	0.018	0.016	0.014	0.010	0.015	0.010	0.015	0.015
Nd	0.004	0.005	0.006	0.003	0.009	0.009	0.004	0.005	0.004	0.003	0.005	0.002	0.008	0.007
Ta	0.000	0.001	0.001	0.000	0.001	0.001	0.003	0.002	0.001	0.000	0.002	0.001	0.004	0.002
REE	0.016	0.019	0.022	0.013	0.028	0.028	0.025	0.025	0.022	0.017	0.023	0.013	0.026	0.025
ΔNNO	-3.79	-6.25	-7.51	-3.65	-8.10	-6.71	-6.77	-7.31	-5.75	-3.99	-3.75	-3.25	-2.45	-4.16

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2
Label	723-2_e1_025c	723-2_e1_025d	723-2_e1_025e	723-2_e1_026a	723-2_e1_026b	723-2_e1_026c	723-2_e2_027a	723-2_e2_027b	723-2_f1_029a	723-2_f1_029b	723-2_f1_029c	723-2_f1_029d	723-2_f1_030a	723-2_f1_030b
zone	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory
Spot size	no	no	no	20	20	20	10	10	no	no	no	no	no	no
Texture	gm	gm	gm	gm	gm	gm	gm	gm	gm	gm	gm	gm	gm	gm
Alteration	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Zoning	osc	osc	osc	osc	osc	osc	osc	osc	osc	osc	osc	osc	osc	osc
Type	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib	Ib
Na_2O	0.55	1.31	0.83	0.91	0.73	1.15	0.77	0.51	0.80	1.23	1.02	0.65	0.49	0.58
Al_2O_3	0.15	0.06	0.06	0.16	0.12	0.07	0.11	0.14	0.06	0.09	0.08	0.13	0.14	0.10
SiO_2	0.01	0.02	0.02	0.03	0.01	0.02	0.03	0.14	0.05	0.09	0.06	0.33	0.00	0.03
K_2O	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CaO	39.12	36.34	37.55	36.76	37.73	36.13	37.74	38.82	37.35	36.51	37.08	38.25	39.37	38.69
TiO_2	55.51	51.43	52.65	51.91	53.59	51.23	53.92	55.26	53.10	51.05	52.57	53.85	55.60	54.89
FeO	1.28	1.52	1.58	1.81	1.68	1.59	1.59	1.53	1.58	1.55	1.47	1.62	1.34	1.49
SrO	0.28	0.15	0.26	0.01	0.21	0.10	0.19	0.23	0.20	0.14	0.22	0.22	0.19	0.22
Nb_2O_5	1.77	5.78	4.37	5.25	3.34	6.16	3.72	2.27	3.84	5.78	5.18	3.03	1.88	2.52
La_2O_3	0.25	0.44	0.38	0.39	0.31	0.56	0.29	0.22	0.36	0.43	0.29	0.30	0.27	0.17
Ce_2O_3	1.16	1.80	1.64	1.82	1.64	1.92	1.40	1.05	1.58	1.85	1.67	1.15	1.01	1.03
Nd_2O_5	0.44	0.61	0.73	0.98	0.82	0.70	0.78	0.17	0.78	0.77	0.52	0.47	0.65	0.55
Ta_2O_5	0.04	0.20	0.00	0.51	0.07	0.23	0.06	0.02	0.07	0.15	0.01	0.00	0.00	0.16
ΣLREE	1.85	2.85	2.75	3.19	2.77	3.18	2.47	1.44	2.72	3.05	2.48	1.92	1.93	1.75
Total	100.58	99.65	100.09	100.54	100.25	99.87	100.60	100.36	99.78	99.64	100.17	100.01	100.94	100.44
Structural for														
Na	0.024	0.060	0.037	0.041	0.033	0.052	0.034	0.023	0.036	0.056	0.046	0.029	0.022	0.026
Al	0.004	0.002	0.002	0.004	0.003	0.002	0.003	0.004	0.002	0.002	0.002	0.004	0.004	0.003
Si	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.003	0.001	0.002	0.001	0.008	0.000	0.001
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ca	0.961	0.914	0.937	0.918	0.938	0.909	0.933	0.953	0.933	0.920	0.924	0.946	0.964	0.953
Ti	0.957	0.908	0.923	0.910	0.935	0.905	0.936	0.952	0.931	0.903	0.919	0.935	0.955	0.949
Fe	0.022	0.027	0.028	0.032	0.029	0.028	0.028	0.026	0.028	0.027	0.026	0.028	0.023	0.026
Sr	0.004	0.002	0.004	0.000	0.003	0.001	0.003	0.003	0.003	0.002	0.003	0.003	0.003	0.003
Nb	0.018	0.061	0.046	0.055	0.035	0.065	0.039	0.024	0.040	0.061	0.054	0.032	0.019	0.026
La	0.002	0.004	0.003	0.003	0.003	0.005	0.002	0.002	0.003	0.004	0.002	0.003	0.002	0.001
Ce	0.010	0.015	0.014	0.016	0.014	0.017	0.012	0.009	0.013	0.016	0.014	0.010	0.008	0.009
Nd	0.004	0.005	0.006	0.008	0.007	0.006	0.006	0.001	0.006	0.006	0.004	0.004	0.005	0.005
Ta	0.000	0.001	0.000	0.003	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001
REE	0.015	0.024	0.023	0.027	0.023	0.027	0.021	0.012	0.023	0.026	0.021	0.016	0.016	0.015
ΔNNO	-4.27	-8.46	-6.33	-6.48	-4.55	-8.65	-5.45	-3.84	-5.63	-8.32	-7.88	-4.42	-4.17	-4.33

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Calonda	Calonda	Calonda	Calonda	Calonda
Label	723-2_f1_030c	723-2_f1_030d	723-2_f1_033a	723-2_f1_033_2	723-2_f1_033_2	723-2_d2_020a	723-2_d2_020b	723-2_f1_032a	723-2_f1_032b	816-2_a1_001	816-2_a1_002	816-2_a1_003	816-2_a2_006	816-2_b1_007
zone	oscillatory	oscillatory	oscillatory	oscillatory	oscillatory	core	rim	core	rim	core	core	core	core	core
Spot size	no	no	no	no	no	40	40	15	15	10	10	<10	15	<10
Texture	gm	gm	gm	gm	gm	big gm	big gm	gm	gm	gm	gm	gm	gm	gm
Alteration	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Zoning	osc	osc	osc	osc	osc	reverse	reverse	reverse	reverse	-	-	-	-	-
Type	Ib	Ib	Ib	Ib	Ib	Ia	IIb	Ia	IIb?	Ia	Ia	Ia	Ia	Ia
Na_2O	0.74	0.95	0.54	0.61	0.43	0.44	1.63	0.61	0.76	0.73	1.19	1.19	1.22	0.98
Al_2O_3	0.08	0.04	0.08	0.12	0.12	0.19	0.09	0.14	0.12	0.04	0.06	0.08	0.10	0.06
SiO_2	0.03	0.07	0.04	0.03	0.11	0.04	0.03	0.00	0.23	0.06	0.31	0.11	0.06	0.11
K_2O	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CaO	37.65	37.39	38.46	38.42	38.75	39.30	33.82	38.78	37.86	36.47	34.48	34.73	34.20	35.12
TiO_2	53.08	52.11	54.68	55.01	55.45	56.57	47.22	54.90	52.39	55.63	51.44	51.80	52.19	53.31
FeO	1.62	1.81	1.41	1.60	1.50	1.01	1.55	1.48	1.91	1.59	2.07	1.96	1.95	2.00
SrO	0.20	0.18	0.22	0.25	0.22	0.12	0.03	0.22	0.21	0.26	0.06	0.08	0.00	0.29
Nb_2O_5	4.29	5.47	2.23	2.38	1.75	0.49	10.61	1.96	4.12	1.91	4.51	4.39	3.95	3.09
La_2O_3	0.20	0.29	0.23	0.21	0.19	0.20	0.67	0.12	0.22	0.67	0.75	0.77	0.82	1.04
Ce_2O_3	1.39	1.51	1.03	1.13	0.97	1.04	2.27	1.20	1.26	1.97	2.77	2.70	2.79	2.68
Nd_2O_5	0.54	0.68	0.40	0.13	0.47	0.35	1.05	0.39	0.31	0.74	1.10	1.16	1.38	0.85
Ta_2O_5	0.24	0.14	0.00	0.00	0.00	0.01	0.41	0.00	0.00	0.12	0.29	0.53	0.46	0.19
ΣLREE	2.13	2.48	1.66	1.47	1.63	1.59	3.99	1.71	1.79	3.38	4.62	4.63	4.99	4.57
Total	100.06	100.65	99.32	99.87	99.94	99.77	99.38	99.79	99.39	100.20	99.03	99.50	99.11	99.72
Structural for														
Na	0.033	0.043	0.024	0.027	0.019	0.020	0.076	0.027	0.034	0.033	0.055	0.055	0.056	0.045
Al	0.002	0.001	0.002	0.003	0.003	0.005	0.003	0.004	0.003	0.001	0.002	0.002	0.003	0.002
Si	0.001	0.002	0.001	0.001	0.003	0.001	0.001	0.000	0.005	0.001	0.007	0.003	0.001	0.003
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ca	0.937	0.929	0.956	0.948	0.955	0.967	0.868	0.960	0.946	0.904	0.877	0.881	0.870	0.884
Ti	0.927	0.909	0.954	0.953	0.959	0.977	0.850	0.953	0.918	0.968	0.918	0.922	0.932	0.942
Fe	0.028	0.032	0.025	0.028	0.026	0.017	0.028	0.026	0.034	0.028	0.037	0.035	0.035	0.035
Sr	0.003	0.002	0.003	0.003	0.003	0.002	0.000	0.003	0.003	0.003	0.001	0.001	0.000	0.004
Nb	0.045	0.057	0.023	0.025	0.018	0.005	0.115	0.020	0.043	0.020	0.048	0.047	0.042	0.033
La	0.002	0.002	0.002	0.002	0.002	0.002	0.006	0.001	0.002	0.006	0.007	0.007	0.007	0.009
Ce	0.012	0.013	0.009	0.010	0.008	0.009	0.020	0.010	0.011	0.017	0.024	0.023	0.024	0.023
Nd	0.004	0.006	0.003	0.001	0.004	0.003	0.009	0.003	0.003	0.006	0.009	0.010	0.012	0.007
Ta	0.002	0.001	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.001	0.002	0.003	0.003	0.001
REE	0.018	0.021	0.014	0.012	0.014	0.013	0.035	0.014	0.015	0.029	0.040	0.040	0.043	0.039
ΔNNO	-6.05	-6.77	-4.27	-3.66	-3.28	-3.77	-14.88	-3.63	-4.55	-3.08	-4.31	-4.64	-4.09	-2.76

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Calonda	Calonda	Calonda	Calonda	Calonda	Calonda	Calonda	Calonda	Calonda	Calonda	Calonda	Calonda	Calonda	Calonda
Label	816-2_b1_008	816-3_b1_009a	816-3_b1_009b	816-3_b2_012	816-3_b3_013	816-3_b3_015	816-3_b3_016	816-3_d1_022	816-4-a1-001b	816-4-a1-002	816-4-b1-004b	816-3_c1_019_1	816-3_c1_019_2	816-3_c2_020b
zone	core	core	rim	core	core	core	core	core	core	core	oscillatory	core	core	oscillatory
Spot size	10	10	10	<10	<10	10	10	20	15	10	20	<10	<10	25
Texture	gm	gm	gm	gm	gm	gm	gm	gm	gm	gm	gm	reaction rim	reaction rim	gm
Alteration	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Zoning	normal	normal	normal	-	-	-	normal	normal	normal	-	rare	-	-	osc
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	IIa	IIa	Ib?
Na_2O	0.88	1.25	0.71	1.05	1.26	0.74	1.21	1.34	0.89	0.74	1.03	0.59	0.67	1.21
Al_2O_3	0.02	0.06	0.03	0.06	0.06	0.08	0.09	0.07	0.08	0.05	0.05	0.05	0.06	0.01
SiO_2	0.23	0.12	0.09	0.10	0.07	0.06	0.07	0.06	0.05	0.03	0.05	0.07	0.08	0.08
K_2O	-	-	-	-	-	-	-	-	0.07	0.05	0.05	-	-	-
CaO	35.97	34.45	36.57	35.62	34.31	37.39	34.22	34.22	37.20	38.16	36.00	37.87	37.26	34.80
TiO_2	54.31	52.27	55.24	53.55	50.95	56.47	52.59	52.36	54.70	55.89	52.50	56.92	56.31	52.74
FeO	1.89	2.24	1.69	1.72	2.32	1.37	1.96	1.84	1.45	1.55	1.79	2.06	1.94	1.78
SrO	0.19	0.10	0.26	0.16	0.25	0.24	0.04	0.02	0.21	0.26	0.20	0.28	0.34	0.22
Nb_2O_5	2.49	3.98	1.67	3.28	5.68	1.63	4.15	3.78	2.00	1.43	4.23	0.46	0.84	3.69
La_2O_3	0.57	0.80	0.74	0.77	0.88	0.57	0.79	0.85	0.64	0.64	0.74	0.32	0.57	1.07
Ce_2O_3	2.14	2.73	1.80	2.52	2.71	1.62	2.88	3.02	2.19	1.49	2.44	0.75	1.51	3.02
Nd_2O_5	0.81	1.25	0.72	0.85	1.30	0.12	1.02	1.14	-	-	-	0.29	0.28	1.23
Ta_2O_5	0.21	0.12	0.21	0.19	0.10	0.00	0.31	0.66	0.04	0.20	0.00	0.01	0.10	0.18
ΣLREE	3.52	4.78	3.26	4.14	4.89	2.31	4.69	5.01	2.83	2.13	3.18	1.36	2.36	5.32
Total	99.72	99.38	99.74	99.86	99.88	100.29	99.33	99.35	99.52	100.51	99.09	99.66	99.97	100.02
Structural for														
Na	0.040	0.057	0.032	0.048	0.058	0.033	0.055	0.062	0.040	0.033	0.047	0.026	0.030	0.055
Al	0.001	0.002	0.001	0.002	0.002	0.002	0.003	0.002	0.002	0.001	0.001	0.001	0.002	0.000
Si	0.005	0.003	0.002	0.002	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.002	0.002	0.002
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.002	0.000	0.000	0.000
Ca	0.898	0.873	0.911	0.893	0.870	0.919	0.867	0.869	0.928	0.939	0.908	0.931	0.920	0.879
Ti	0.952	0.930	0.966	0.943	0.907	0.974	0.935	0.934	0.958	0.965	0.930	0.982	0.976	0.935
Fe	0.033	0.040	0.030	0.030	0.041	0.024	0.035	0.033	0.025	0.027	0.032	0.036	0.034	0.032
Sr	0.003	0.001	0.004	0.002	0.003	0.003	0.001	0.000	0.003	0.003	0.003	0.004	0.005	0.003
Nb	0.026	0.043	0.018	0.035	0.061	0.017	0.044	0.041	0.021	0.015	0.045	0.005	0.009	0.039
La	0.005	0.007	0.006	0.007	0.008	0.005	0.007	0.007	0.005	0.005	0.006	0.003	0.005	0.009
Ce	0.018	0.024	0.015	0.022	0.023	0.014	0.025	0.026	0.019	0.013	0.021	0.006	0.013	0.026
Nd	0.007	0.011	0.006	0.007	0.011	0.001	0.009	0.010	0.000	0.000	0.000	0.002	0.002	0.010
Ta	0.001	0.001	0.001	0.001	0.001	0.000	0.002	0.004	0.000	0.001	0.000	0.000	0.001	0.001
REE	0.030	0.041	0.028	0.035	0.042	0.019	0.040	0.043	0.024	0.018	0.027	0.011	0.020	0.046
ΔNNO	-2.49	-2.85	-2.30	-4.26	-4.77	-3.70	-4.33	-4.36	-3.78	-2.66	-5.20	0.80	-0.19	-4.52

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Calonda	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1
Label	816-3_d1_024	H1-16a_1_001	H1-16a_1_002	H1-16a_1_003	H1-16a_1_004	H1-16a_2_006	H1-16a_2_007	H1-16a_2_008	H1-16a_2_009	H1-16a_2_010	H1-16a_3_011	H1-16a_3_012	H1-16a_3_013	H1-16a_3_014
zone	oscillatory	core	core	core	core	core	core	core	core	core	core	core	core	core
Spot size	15	30	20	15	30	10	25	25	15	15	15	15	15	15
Texture	gm	gm	gm	gm	necklace	necklace	gm	gm	necklace	necklace	necklace	gm	necklace	gm
Alteration	no	no	TiO_2	no	TiO_2	TiO_2	TiO_2	no	TiO_2	TiO_2	TiO_2	TiO_2	TiO_2	TiO_2
Zoning	osc	-	-	-	-	-	-	-	-	-	-	-	-	-
Type	Ib?	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia
Na_2O	1.19	0.38	0.20	0.51	0.42	0.40	0.44	0.29	0.34	0.40	0.33	0.46	0.35	0.39
Al_2O_3	0.06	0.17	0.23	0.19	0.15	0.20	0.20	0.21	0.18	0.21	0.22	0.18	0.19	0.18
SiO_2	0.08	0.00	0.20	0.03	0.02	0.02	0.01	0.02	0.06	0.05	0.05	0.06	0.05	0.07
K_2O	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CaO	34.29	38.53	37.61	38.22	38.49	39.34	38.60	39.67	39.00	39.38	39.09	38.98	39.00	39.29
TiO_2	52.10	55.55	57.15	55.83	55.75	56.04	55.65	55.85	55.41	55.42	56.03	55.40	55.78	55.52
FeO	1.75	1.32	1.70	1.27	1.35	1.37	1.33	1.45	1.30	1.42	1.37	1.49	1.38	1.50
SrO	0.00	0.11	0.17	0.08	0.18	0.18	0.13	0.17	0.10	0.16	0.10	0.16	0.15	0.08
Nb_2O_5	4.63	0.64	0.39	0.61	0.44	0.69	0.69	0.87	0.54	0.75	0.67	0.58	0.80	0.58
La_2O_3	0.87	0.17	0.26	0.14	0.24	0.32	0.25	0.23	0.21	0.24	0.27	0.17	0.23	0.33
Ce_2O_3	2.87	1.45	1.02	1.56	1.53	1.19	1.33	1.22	1.17	1.31	1.18	1.41	1.27	1.29
Nd_2O_5	1.36	0.77	0.35	0.66	0.68	0.77	0.65	0.46	0.42	0.32	0.47	0.74	0.51	0.56
Ta_2O_5	0.50	0.20	0.15	0.24	0.00	0.01	0.11	0.12	0.36	0.04	0.08	0.20	0.02	0.04
ΣLREE	5.10	2.39	1.63	2.36	2.45	2.28	2.23	1.91	1.80	1.87	1.92	2.32	2.01	2.18
Total	99.70	99.29	99.42	99.36	99.25	100.53	99.39	100.56	99.08	99.69	99.87	99.84	99.74	99.82
Structural for														
Na	0.055	0.017	0.009	0.023	0.019	0.018	0.020	0.013	0.015	0.018	0.015	0.021	0.016	0.017
Al	0.002	0.005	0.006	0.005	0.004	0.005	0.005	0.006	0.005	0.006	0.006	0.005	0.005	0.005
Si	0.002	0.000	0.005	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.002
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ca	0.869	0.958	0.925	0.949	0.957	0.966	0.958	0.973	0.970	0.974	0.963	0.965	0.963	0.971
Ti	0.927	0.970	0.986	0.973	0.973	0.966	0.969	0.962	0.967	0.962	0.969	0.963	0.967	0.963
Fe	0.031	0.023	0.029	0.022	0.024	0.024	0.023	0.025	0.023	0.025	0.024	0.026	0.024	0.026
Sr	0.000	0.001	0.002	0.001	0.002	0.002	0.002	0.002	0.001	0.002	0.001	0.002	0.002	0.001
Nb	0.050	0.007	0.004	0.006	0.005	0.007	0.007	0.009	0.006	0.008	0.007	0.006	0.008	0.006
La	0.008	0.001	0.002	0.001	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.001	0.002	0.003
Ce	0.025	0.012	0.009	0.013	0.013	0.010	0.011	0.010	0.010	0.011	0.010	0.012	0.011	0.011
Nd	0.011	0.006	0.003	0.005	0.006	0.006	0.005	0.004	0.003	0.003	0.004	0.006	0.004	0.005
Ta	0.003	0.001	0.001	0.002	0.000	0.000	0.001	0.001	0.002	0.000	0.001	0.001	0.000	0.000
REE	0.044	0.020	0.014	0.020	0.021	0.019	0.019	0.016	0.015	0.016	0.016	0.019	0.017	0.018
ΔNNO	-5.90	-2.57	-0.67	-2.76	-2.18	-2.49	-2.61	-2.38	-2.53	-2.31	-2.44	-1.78	-2.56	-1.75

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1
Label	H1-16a_4_015	H1-16a_4_016	H1-16a_4_017	H1-16a_4_018	H1-16a_4_019	H1-16a_4_020	H1-16a_4_021	H1-16a_5_022	H1-16a_5_023	H1-16a_6_024	H1-16a_6_025	H1-16a_6_026	H1-16a_7_027	H1-16a_8_028
zone	core	core	core	core	core	core	core	core	core	core	core	core	core	core
Spot size	25	40	30	20	20	40	15	20	35	40	20	20	15	15
Texture	necklace	gm	gm	necklace	necklace	necklace	necklace	gm	gm	gm	necklace	necklace	necklace	necklace
Alteration	TiO_2	TiO_2	TiO_2	TiO_2	TiO_2	TiO_2	TiO_2	TiO_2	TiO_2	TiO_2	TiO_2	TiO_2	TiO_2	TiO_2
Zoning	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia
Na_2O	0.45	0.47	0.58	0.55	0.39	0.37	0.48	0.37	0.44	0.48	0.27	0.47	0.46	0.51
Al_2O_3	0.21	0.18	0.21	0.19	0.24	0.21	0.21	0.19	0.19	0.20	0.23	0.19	0.18	0.24
SiO_2	0.01	0.00	0.01	0.04	0.06	0.00	0.01	0.00	0.01	0.01	0.00	0.02	0.00	0.02
K_2O	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CaO	38.71	39.06	38.75	39.21	39.48	39.70	39.15	39.15	39.24	38.88	40.08	39.07	38.74	38.98
TiO_2	56.28	55.50	55.33	56.06	55.92	56.40	55.65	55.67	56.07	55.73	55.90	55.79	56.00	55.68
FeO	1.48	1.31	1.34	1.40	1.36	1.38	1.27	1.24	1.17	1.45	1.31	1.39	1.37	1.29
SrO	0.11	0.08	0.09	0.04	0.15	0.13	0.14	0.12	0.08	0.06	0.12	0.10	0.07	0.11
Nb_2O_5	0.56	0.50	0.61	0.70	0.54	0.62	0.49	0.70	0.58	0.55	0.76	0.58	0.76	0.68
La_2O_3	0.15	0.10	0.22	0.19	0.17	0.17	0.17	0.16	0.22	0.21	0.27	0.32	0.30	0.11
Ce_2O_3	1.32	1.40	1.50	1.34	1.25	1.19	1.53	1.53	1.25	1.50	1.29	1.37	1.49	1.33
Nd_2O_5	0.62	0.58	0.63	0.72	0.28	0.64	0.81	0.74	0.77	0.66	0.01	0.61	0.38	0.37
Ta_2O_5	0.34	0.14	0.32	0.03	0.20	0.05	0.23	0.00	0.12	0.12	0.29	0.43	0.20	0.13
ΣLREE	2.09	2.08	2.35	2.25	1.70	2.00	2.51	2.43	2.24	2.37	1.57	2.30	2.17	1.81
Total	100.26	99.31	99.59	100.46	100.05	100.85	100.15	99.86	100.14	99.85	100.52	100.34	99.95	99.44
Structural for														
Na	0.020	0.021	0.026	0.024	0.017	0.016	0.021	0.017	0.020	0.021	0.012	0.021	0.021	0.023
Al	0.006	0.005	0.006	0.005	0.006	0.006	0.006	0.005	0.005	0.005	0.006	0.005	0.005	0.007
Si	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ca	0.952	0.970	0.962	0.963	0.971	0.970	0.967	0.968	0.967	0.961	0.982	0.963	0.956	0.965
Ti	0.972	0.967	0.964	0.966	0.966	0.967	0.965	0.966	0.969	0.967	0.962	0.965	0.970	0.968
Fe	0.026	0.023	0.023	0.024	0.024	0.024	0.022	0.022	0.020	0.025	0.023	0.024	0.024	0.022
Sr	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.002	0.001	0.001	0.001
Nb	0.006	0.005	0.006	0.007	0.006	0.006	0.005	0.007	0.006	0.006	0.008	0.006	0.008	0.007
La	0.001	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.003	0.003	0.001
Ce	0.011	0.012	0.013	0.011	0.011	0.010	0.013	0.013	0.011	0.013	0.011	0.012	0.013	0.011
Nd	0.005	0.005	0.005	0.006	0.002	0.005	0.007	0.006	0.006	0.005	0.000	0.005	0.003	0.003
Ta	0.002	0.001	0.002	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.002	0.003	0.001	0.001
REE	0.017	0.018	0.020	0.019	0.014	0.017	0.021	0.020	0.019	0.020	0.013	0.019	0.018	0.015
ΔNNO	-1.83	-2.44	-2.46	-2.37	-2.32	-2.38	-2.63	-3.03	-3.19	-1.92	-2.85	-2.24	-2.55	-2.78

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2
Label	H1-16c_1_031	H1-16c_1_032	H1-16c_1_033	H1-16c_1_034	H1-16c_2_035bi	H1-16c_2_036	H1-16c_2_037	H2-8_1_038	H2-8_1_039	H2-8_2_040	H2-8_2_041	H2-8_2_042	H2-8_3_043	H2-8_4_044
zone	core	core	core	core	core	core	core	core	core	core	core	core	core	core
Spot size	15	20	15	20	40	35	20	5	5	10	<5	10	25	15
Texture	gm	necklace	gm	gm	gm	gm	gm	gm	gm	gm	gm	gm	gm	gm
Alteration	TiO_2	TiO_2	TiO_2	TiO_2	TiO_2	TiO_2	TiO_2 + FeO	TiO_2	TiO_2 + FeO	TiO_2	TiO_2 + FeO	TiO_2	TiO_2	TiO_2
Zoning	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia
Na_2O	0.42	0.33	0.52	0.34	0.34	0.40	0.50	0.52	0.39	0.39	0.39	0.40	0.58	0.33
Al_2O_3	0.19	0.23	0.15	0.25	0.19	0.17	0.21	0.15	0.16	0.12	0.12	0.21	0.16	0.19
SiO_2	0.00	0.00	0.06	0.04	0.10	0.00	0.00	0.03	0.02	0.02	0.00	0.05	0.02	0.03
K_2O	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CaO	39.37	39.85	38.66	39.52	39.69	38.99	39.20	39.12	39.66	39.89	39.48	39.24	38.67	39.75
TiO_2	56.16	56.14	55.68	55.92	56.00	56.07	55.87	56.46	56.65	56.57	56.30	56.37	56.34	56.27
FeO	1.24	1.32	1.17	1.38	1.35	1.30	1.27	1.24	1.26	1.27	1.18	1.43	1.21	1.32
SrO	0.14	0.14	0.13	0.12	0.17	0.17	0.13	0.11	0.15	0.15	0.11	0.17	0.17	0.15
Nb_2O_5	0.50	0.65	0.42	0.54	0.57	0.77	0.72	0.61	0.57	0.41	0.75	0.39	0.58	0.60
La_2O_3	0.09	0.24	0.28	0.31	0.14	0.35	0.32	0.18	0.24	0.16	0.27	0.25	0.20	0.20
Ce_2O_3	1.45	1.21	1.39	1.41	1.33	1.44	1.60	1.40	1.13	1.13	1.26	1.17	1.50	1.11
Nd_2O_5	0.61	0.56	0.58	0.38	0.41	0.47	0.66	0.77	0.55	0.46	0.80	0.58	0.51	0.28
Ta_2O_5	0.16	0.00	0.27	0.28	0.26	0.20	0.21	0.15	0.06	0.21	0.17	0.09	0.06	0.08
ΣLREE	2.15	2.01	2.25	2.10	1.88	2.26	2.58	2.35	1.92	1.75	2.33	2.00	2.21	1.59
Total	100.33	100.67	99.31	100.49	100.54	100.33	100.69	100.75	100.85	100.77	100.83	100.37	100.01	100.31
Structural for														
Na	0.019	0.015	0.023	0.015	0.015	0.018	0.022	0.023	0.017	0.017	0.017	0.018	0.026	0.015
Al	0.005	0.006	0.004	0.007	0.005	0.005	0.006	0.004	0.004	0.003	0.003	0.006	0.004	0.005
Si	0.000	0.000	0.001	0.001	0.002	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.001
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ca	0.968	0.976	0.961	0.971	0.973	0.960	0.964	0.958	0.968	0.975	0.967	0.963	0.953	0.974
Ti	0.969	0.965	0.971	0.964	0.964	0.969	0.964	0.971	0.971	0.970	0.968	0.971	0.975	0.968
Fe	0.021	0.023	0.020	0.024	0.023	0.022	0.022	0.021	0.022	0.022	0.020	0.025	0.021	0.023
Sr	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.002	0.002	0.001	0.002	0.002	0.002
Nb	0.005	0.007	0.004	0.006	0.006	0.008	0.007	0.006	0.006	0.004	0.008	0.004	0.006	0.006
La	0.001	0.002	0.002	0.003	0.001	0.003	0.003	0.002	0.002	0.001	0.002	0.002	0.002	0.002
Ce	0.012	0.010	0.012	0.012	0.011	0.012	0.013	0.012	0.009	0.009	0.011	0.010	0.013	0.009
Nd	0.005	0.005	0.005	0.003	0.003	0.004	0.005	0.006	0.004	0.004	0.007	0.005	0.004	0.002
Ta	0.001	0.000	0.002	0.002	0.002	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.000	0.000
REE	0.018	0.017	0.019	0.018	0.016	0.019	0.022	0.020	0.016	0.015	0.019	0.017	0.019	0.013
ΔNNO	-2.79	-2.66	-2.95	-2.25	-2.42	-2.88	-2.95	-2.95	-2.83	-2.58	-3.39	-1.84	-3.02	-2.59

A5.1. Major-element composition of groundmass perovskites in the studied kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens.

Kimberlite	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2	Lucapa 2
Label	H2-8_4_045	H2-8_5_047	H2-8_5_048	H2-8_6_049	H2-8_6_050	H2-8_6_051	H2-8_6_052
zone	core	core	core	core	core	core	core
Spot size	10	10	20	15	15	15	20
Texture	gm	gm	gm	necklace	necklace	gm	gm
Alteration	TiO_2	TiO_2	TiO_2	TiO_2	TiO_2	TiO_2	TiO_2
Zoning	-	-	-	-	-	-	-
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia
Na_2O	0.25	0.50	0.33	0.42	0.44	0.54	0.42
Al_2O_3	0.22	0.21	0.18	0.15	0.12	0.14	0.18
SiO_2	0.00	0.05	0.00	0.02	0.00	0.03	0.03
K_2O	-	-	-	-	-	-	-
CaO	40.17	38.62	40.25	39.51	39.77	39.33	39.20
TiO_2	56.29	56.19	56.76	56.50	56.40	56.17	56.38
FeO	1.25	1.40	1.15	1.35	1.18	1.31	1.17
SrO	0.19	0.13	0.19	0.03	0.11	0.10	0.06
Nb_2O_5	0.67	1.07	0.81	0.64	0.42	0.66	0.36
La_2O_3	0.11	0.22	0.15	0.23	0.24	0.26	0.18
Ce_2O_3	0.80	1.52	0.80	1.26	1.21	1.39	1.47
Nd_2O_5	0.32	0.67	0.12	0.59	0.72	0.27	0.63
Ta_2O_5	0.25	0.09	0.03	0.14	0.00	0.09	0.19
ΣLREE	1.23	2.41	1.07	2.08	2.17	1.92	2.28
Total	100.53	100.68	100.77	100.84	100.62	100.28	100.26
Structural for							
Na	0.011	0.022	0.015	0.019	0.020	0.024	0.019
Al	0.006	0.006	0.005	0.004	0.003	0.004	0.005
Si	0.000	0.001	0.000	0.000	0.000	0.001	0.001
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ca	0.982	0.947	0.980	0.966	0.975	0.966	0.964
Ti	0.966	0.967	0.970	0.969	0.970	0.968	0.973
Fe	0.021	0.024	0.020	0.023	0.020	0.023	0.020
Sr	0.003	0.002	0.003	0.000	0.001	0.001	0.001
Nb	0.007	0.011	0.008	0.007	0.004	0.007	0.004
La	0.001	0.002	0.001	0.002	0.002	0.002	0.002
Ce	0.007	0.013	0.007	0.011	0.010	0.012	0.012
Nd	0.003	0.005	0.001	0.005	0.006	0.002	0.005
Ta	0.002	0.001	0.000	0.001	0.000	0.001	0.001
REE	0.010	0.020	0.009	0.017	0.018	0.016	0.019
ΔNNO	-3.00	-2.86	-3.63	-2.53	-2.96	-2.70	-2.92

A5.2. Trace-element composition of perovskite in the studied kimberlites. Data in ppm.

Label	704-2_a1_1	704-2_b1_6	704-2_b1_8	705-2d-C1-18	705-2d-C1-23	705-2d-D1-27	706-2_d2_019	706-2_e2_31	706-2-A1-01	706-2-A1-02	706-2-B1-09	706-2-B1-10	706-2-D1-14	706-2-D1-17	706-2-E1-28
Kimberlite	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1
Spot size (μm)	30	20	20	35	50	20	20	30	20	20	20	20	25	20	15
Texture	necklace	gm	reaction rim	gm	gm	necklace	necklace	gm	reaction rim	gm	gm	gm	gm	reaction rim	reaction rim
Zoning	-	-	-	-	normal	normal	normal	rare	normal	-	normal	normal	normal	-	normal
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ib	IIa	Ia	Ia	Ia	Ia	IIa	IIa
Na	2690	1713	2890	2290	3530	4840	2200	8490	5140	4660	7210	2240	3880	4600	5810
Mg	386	16340	2480	2400	633	1315	33400	4170	346	4500	1939	1747	9720	11170	1883
K	67	576	259	134.1	125.8	101.1	546	256	90.2	224	137.7	56.3	72.8	375	107.9
Sc	2.87	10.67	3.48	50	4.49	3.81	7.36	5.06	4.09	4.30	4.86	4.31	11.34	3.94	5.79
V	81.8	129.9	103.6	108.4	109.8	125.4	82.7	110.5	122.6	124.5	165.5	97.2	223	149.7	147.4
Fe	4900	33000	10800	6440	6130	7380	20100	9220	6930	9080	18160	6080	69000	12650	11730
Rb	0.279	5.18	3.37	0.518	0.486	0.1140	2.83	0.694	bd	0.799	bd	0.1650	0.1580	2.62	0.0660
Sr	983	1148	992	1530	1562	2050	1382	6860	1647	1643	3910	1439	1640	3170	5120
Y	183.3	150.8	175	235	248	239	156.1	49.8	249	272	184.6	229	258	226	190.1
Zr	387	410	327	633	492	448	534	950	459	559	660	637	622	680	816
Nb	5560	2890	4590	4810	5730	7610	3830	12130	8050	9710	10970	5050	7530	7930	9350
Ba	8.05	71.6	15.34	13.38	13.66	11.38	63	30.7	5.50	69.6	13.51	4.13	16.95	24.6	18.98
La	3260	2260	3620	2800	3920	8430	2510	31300	6200	4890	17240	2890	4050	12060	19030
Ce	8420	4240	9320	4770	8430	19380	5550	63100	15410	12550	37300	5810	9970	24200	35900
Pr	962	420	1060	460	877	2160	615	6320	1825	1434	3930	582	1141	2360	3530
Nd	3580	1413	3860	1546	3130	7240	2170	18010	6340	5330	11720	2040	4250	7200	10460
Sm	466	202	481	230	428	780	288	976	744	696	978	303	563	686	843
Eu	106.8	54.5	107.3	66.3	105.6	161.7	70.1	144.7	163.4	156.6	188.5	80.1	128.3	158	168.9
Gd	246	131.2	237	171.1	238	352	160	308	355	350	370	186.8	287	324	340
Tb	23.2	14.27	22.9	18.05	24.9	31.6	15.93	17.2	32.5	33.7	29.5	20.2	29.1	28.3	27.3
Dy	92.3	61.6	88.7	79.9	103.5	122.1	67	43.1	129.6	134.8	111	98.4	117.2	118	103.5
Ho	11.84	8.78	11.71	11.74	13.35	14.56	8.89	4.30	16	16.62	12.28	12.58	14.96	14.77	12.6
Er	19.37	15.44	19.39	22.8	24.3	23.4	16.55	7.07	25.1	27.2	18.64	22.3	26	22.2	17.93
Tm	1.60	1.410	1.547	2.01	2.18	2.03	1.325	0.351	2.11	2.15	1.460	2.01	2.16	1.80	1.510
Yb	6.57	6.40	6.38	9.58	9.22	7.34	5.72	1.390	8.43	8.84	5.57	9.75	8.71	8.36	7.07
Lu	0.522	0.641	0.640	1.040	0.828	0.578	0.604	0.1110	0.641	0.834	0.342	0.788	0.815	0.752	0.579
Hf	18.24	15.62	15.95	28.8	20.3	22.9	20.1	56.5	21	27.4	33.9	29.6	27.1	33.2	40.8
Ta	849	176.3	827	155.5	386	1341	390	1548	1432	1307	1772	219	892	383	556
Th	1327	19.93	1240	22.4	220	2460	497	3270	2690	1911	3310	49	1253	291	569
U	337	130.3	320	125.6	240	399	190	67.5	437	485	370	191.3	380	324	273
REE	17190	8830	18830	10190	17310	38700	11480	120200	31300	25600	71900	12060	20600	47200	70500
LREE	17040	8720	18680	10050	17130	38500	11360	120100	31000	25400	71800	11900	20400	47000	70300
HREE	155.4	108.5	151.3	145.1	178.3	202	116.1	73.5	214	224	178.7	166.1	198.9	194.1	170.5
Ta+Nb	6410	3070	5420	4960	6120	8950	4220	13680	9480	11010	12740	5270	8420	8310	9910
Th+U	1664	150.2	1560	147.9	460	2860	687	3330	3130	2400	3680	240	1633	615	842

A5.2. Trace-element composition of perovskite in the studied kimberlites. Data in ppm.

Label	706-2-E1-29	707-1_b2_018	707-1_f1_035	707-1_f1_040b	707-1-A1_04	707-1-A2_08	707-1-B1_12	707-1-B1_13	707-1-B2_14	707-1-B2_15	707-1-C1_19	707-1-C1_20	707-1-C2_26	707-1-F1_36	707-1-F1_40
Kimberlite	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1
Spot size (μm)	15	25	25	20	15	20	20	25	15	15	20	20	20	20	20
Texture	reaction rim	gm	gm	necklace	reaction rim	gm	reaction rim	gm	reaction rim	gm	gm	gm	gm	gm	necklace
Zoning	-	-	-	normal	-	-	-	-	-	-	-	-	-	-	normal
Type	IIa	Ia	Ia	Ia	IIa	Ia	IIa	Ia	IIa	Ia	Ia	Ia	Ia	Ia	Ia
Na	3970	1983	2020	2260	3320	3770	3100	4500	4160	4370	3460	4100	5320	3480	5310
Mg	3550	6640	9080	18010	3430	6480	335	610	363	1004	421	366	343	3370	379
K	81.9	61.2	327	448	80.1	310	49	82.9	78.3	93.5	73.7	74.2	96	79.6	102.9
Sc	5.34	8.25	4.84	6.69	7.01	4.65	4.91	4.28	4.61	4.29	4.95	4.26	4.40	4.33	4.23
V	119.5	121.1	90.3	93.3	121.7	121.2	108.5	122.3	114.5	115.6	116	116.5	126	110.5	122.2
Fe	10690	31200	10610	14590	13450	11930	5610	7030	6850	6700	7290	6730	7440	6730	7380
Rb	0.1950	0.263	1.890	2.81	0.1260	1.150	<0.041	0.1560	0.1580	0.1940	0.0610	bd	bd	0.211	0.0890
Sr	1972	1267	951	1019	1489	1358	1416	1319	1246	1303	1558	1258	1338	1323	1325
Y	248	170.8	185.4	180.3	255	271	278	284	269	276	263	280	294	269	277
Zr	664	393	424	498	586	529	532	594	511	543	514	571	608	504	554
Nb	9890	4410	4300	5000	6750	7100	6230	9300	8160	7850	7360	8720	9430	6810	8850
Ba	75.9	14.22	73.4	65.5	41.6	53.7	5.21	10.16	5.40	6.36	10.03	6.24	5.17	5.49	5.62
La	4680	2450	2420	2690	3980	4430	4260	5390	4870	5010	4640	5170	5500	4530	5390
Ce	13460	6230	5730	6970	10390	11390	9220	15490	13840	13210	12080	14280	15490	11620	14980
Pr	1553	684	603	774	1151	1392	1057	2020	1663	1692	1519	1818	1988	1371	1851
Nd	5880	2430	2130	2860	3950	4910	3750	7590	6250	6250	5360	6710	7250	4930	6990
Sm	763	327	311	380	557	645	521	925	789	788	699	843	911	651	887
Eu	167.6	81.5	78.1	90.6	131.6	151.3	130.9	198.4	179.8	172	162.5	184.8	198.2	146.6	190.1
Gd	356	183.2	182.3	203	300	340	311	430	414	392	358	415	438	338	416
Tb	34.4	17.96	18.85	20.2	29.7	33.7	32.1	40.8	36.3	37.8	32.9	38.9	41.1	32.1	39.5
Dy	134.7	81.3	79.8	85.9	122.2	130.4	135.1	153.4	146.1	146	139.9	154.3	160.3	134.5	156.2
Ho	15.81	10.22	11.07	11.2	15.68	16.88	17.97	19.11	18.89	17.78	16.42	18.92	19.46	17.06	18.79
Er	25.3	17.57	17.04	18.74	27.4	27.3	29.2	30.6	27.2	28.5	27.4	30.5	31.5	28	29.5
Tm	2.21	1.466	1.695	1.820	2.20	2.34	2.68	2.62	2.57	2.25	2.18	2.47	2.73	2.40	2.52
Yb	9.43	6.50	7.29	7.22	8.55	10.16	11.13	10.26	11.25	9.57	8.77	10.21	10.11	10.28	9.91
Lu	0.818	0.522	0.659	0.528	0.976	0.913	1.160	0.852	0.840	0.767	0.888	0.972	0.962	0.816	0.867
Hf	32.3	16.19	17.66	23.3	27.3	24.4	23.8	31.4	24.5	25.7	24.6	27.9	32.3	24.7	28.9
Ta	1700	411	326	703	666	1149	497	2590	1745	1787	1359	1995	2380	1084	2230
Th	2350	294	157.1	1131	303	1553	153.3	5150	2900	3260	1951	3610	4360	1433	4280
U	637	245	220	283	423	468	377	680	587	546	504	632	674	449	645
REE	27100	12520	11590	14110	20700	23500	19470	32300	28300	27800	25000	29700	32000	23800	31000
LREE	26900	12390	11450	13960	20500	23300	19240	32000	28000	27500	24800	29400	31800	23600	30700
HREE	223	135.6	136.4	145.6	207	222	229	258	243	243	228	256	266	225	257
Ta+Nb	11590	4820	4630	5700	7410	8250	6720	11900	9900	9640	8720	10720	11810	7890	11080
Th+U	2980	539	377	1414	726	2020	530	5830	3490	3810	2450	4250	5040	1882	4930

A5.2. Trace-element composition of perovskite in the studied kimberlites. Data in ppm.

Label	707-1-G1_44	708-2-A1-01B	708-2-A1-02	708-2-A1-05	708-2-B1-09	708-2-B1-11	708-2-C1-14	720-1_a1_1	720-1_a1_4	723-1-A1-01	723-1-B1-07	723-1-C1-10	723-2_b1_005	723-2_c2_012	723-2_d1_018
Kimberlite	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 1	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2
Spot size (μm)	20	15	15	25	15	10	<10	30	20	20	20	20	30	25	20
Texture	necklace	reaction rim	reaction rim	gm	reaction rim	gm	gm	gm	gm	gm	gm	gm	gm	necklace	gm
Zoning	-	-	-	normal	-	oscillatory	normal	-	-	reverse?	reverse	-	-	-	oscillatory
Type	Ia	IIa	IIa	Ia	IIa	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ib
Na	2490	3700	4940	3760	3580	3200	4250	1413	3220	2780	4300	3050	2130	1673	4010
Mg	1114	6900	349	5020	2180	4680	1684	42700	3830	478	3790	3840	4360	327	3160
K	51.5	342	105.4	96.1	99.9	162.9	80.7	48.7	447	118.2	565	205	395	43	233
Sc	3.20	9.65	4.23	4.28	5.31	4.85	5.20	3.91	3.85	4.54	7.32	5.83	4.73	3.29	4.45
V	81.1	150.5	118.7	115	123.3	107.3	128.2	104.8	110.5	151.2	180.2	161.7	106.3	100.9	129
Fe	5200	15780	7380	8440	19090	8910	16560	17070	7730	6520	11910	9430	5960	3930	6690
Rb	0.0730	0.999	0.0960	0.1780	0.1170	0.574	0.1110	0.1290	2.40	0.1840	1.70	0.242	0.538	bd	0.606
Sr	998	1495	1452	1666	1979	1408	1351	888	837	1267	1344	1304	771	773	1030
Y	197.5	304	282	251	267	281	279	142.3	148.3	220	257	231	140.4	149.2	202
Zr	396	821	625	551	602	704	639	312	254	418	897	724	203	215	1218
Nb	5420	8400	9400	7990	7750	7500	9340	4380	4330	8440	19240	12250	2790	2870	22100
Ba	4.44	14.86	7.10	29.4	16.17	6.72	8.82	3.34	78.6	4.48	88.3	2.72	4.43	1.890	2.96
La	3440	4580	5580	4470	4880	4340	5140	1739	1957	3040	3730	3120	1673	1841	3160
Ce	8950	10830	15100	12240	12640	10260	13950	4460	6200	8410	10750	8860	4820	5030	9270
Pr	1123	1202	1863	1354	1538	1166	1708	500	765	1079	1335	1017	617	615	1133
Nd	4130	4360	6790	5040	5510	4320	6290	1817	3020	4020	5180	3840	2410	2360	4210
Sm	510	602	852	660	716	580	809	251	409	536	682	515	333	324	564
Eu	113.1	145.1	185.7	153.4	161.1	137.5	172.8	62.7	92.1	121.7	153	121.7	78	77.1	128.2
Gd	255	341	412	324	359	316	393	149.5	203	280	347	275	176	176.8	288
Tb	25.2	33.1	37.9	32.1	34.1	32.4	37	14.97	19.39	26.8	33.6	26.1	16.87	17.51	27.4
Dy	100.2	144	151	127.1	140.5	135	149	63.6	78.1	108.6	136.6	108.5	69.1	71.5	109.1
Ho	12.79	18.73	18.31	15.74	16.92	16.75	17.75	8.50	10.01	13.93	16.46	13.42	8.85	9.17	13.74
Er	21.4	31.6	29.5	26.2	27.5	27.8	28.9	15.04	16.54	22.4	27.2	24.5	14.8	16.39	24.2
Tm	1.712	2.72	2.38	2.16	2.38	2.42	2.43	1.268	1.305	1.820	2.39	2.24	1.347	1.383	1.870
Yb	7.15	11.46	9.18	7.83	8.88	10.75	9.72	5.68	5.26	7.77	9.75	8.34	5.75	5.28	8.40
Lu	0.674	0.992	0.950	0.750	0.884	0.977	0.851	0.479	0.505	0.781	0.926	0.993	0.565	0.551	0.691
Hf	18.81	37.5	31.6	27.4	28	32	33.3	12.51	11.37	19.67	44.1	37.1	8.76	10.06	61.2
Ta	1038	727	2220	1250	1126	858	2130	328	822	977	1607	834	659	563	1133
Th	1715	227	4160	1843	1414	826	3840	179.5	967	891	1825	767	573	547	1434
U	355	457	618	511	508	423	608	155	264	308	451	317	229	191.3	347
REE	18690	22300	31000	24500	26000	21300	28700	9090	12780	17670	22400	17930	10220	10540	18930
LREE	18520	22100	30800	24300	25800	21100	28500	8980	12650	17490	22200	17740	10110	10420	18750
HREE	169.1	243	249	212	231	226	246	109.6	131.1	182	227	184.2	117.2	121.8	185.3
Ta+Nb	6460	9130	11620	9240	8870	8360	11480	4710	5150	9410	20800	13080	3450	3430	23300
Th+U	2070	684	4780	2350	1923	1249	4450	334	1230	1199	2280	1084	802	738	1782

A5.2. Trace-element composition of perovskite in the studied kimberlites. Data in ppm.

Label	723-2_e1_023	723-2-C1_10	723-2-C2_14	723-2-D2_20A	723-2-D2_20B	723-2-E1-26	723-2-F1-32A	723-2-F1-32B	728-4-A1_03	728-4-B2_13	728-4-B2_15	728-4-C1_16	728-4-D1_23	728-4-D1_24	728-4-F1_34
Kimberlite	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2	Mulepe 2
Spot size (μm)	20	15	15	15	10	15	15	10	20	20	20	20	20	20	20
Texture	gm	gm	gm	big gm	big gm	gm	gm	gm	gm	necklace	necklace	necklace	necklace	gm	gm
Zoning	-	oscillatory	oscillatory	reverse	reverse	oscillatory	reverse	reverse	-	-	-	-	-	-	-
Type	Ia	Ib	Ib	Ia	IIb	Ib	Ia	IIb	Ia	Ia	Ia	Ia	Ia	Ia	Ia
Na	1607	5590	2170	5080	6400	4400	3920	3500	1634	2460	2040	1769	1259	1448	2060
Mg	1394	3680	2810	442	15310	2340	783	59100	256	5400	8340	312	843	349	6230
K	76.9	474	498	112.2	6850	78.2	115.9	20100	39.8	133	68.5	46.8	41.2	52.5	443
Sc	3.49	8.42	3.74	4.05	33.8	6.06	4.35	15.21	3.45	3.85	4.28	3.78	3.81	4.29	5.29
V	103.8	160.3	113.3	105.1	169.7	167.1	147.5	221	100.9	111.9	108.6	107.3	96.7	99.8	106.8
Fe	5500	16550	5920	5580	40700	8500	7160	57800	4240	7460	9780	4720	4400	4670	8000
Rb	0.388	1.480	2.26	0.1620	23.9	0.1080	0.1820	54.6	bd	0.632	0.1030	<0.016	0.080	0.257	2.47
Sr	843	1724	1087	898	984	1300	1315	1881	786	787	817	793	838	874	871
Y	140.4	175.1	207	166.1	108.2	270	223	171.6	162.1	175.6	168.9	176.6	160.1	150.6	171.2
Zr	245	2820	1242	598	1220	1475	1251	1310	263	293	275	304	319	363	400
Nb	4330	55000	19390	20300	20600	19900	17260	14080	3100	3750	3350	3720	3060	3030	3380
Ba	2.71	36	10.77	1.350	27.9	3.14	6.45	78.1	1.90	2.49	2.01	4.36	1.640	1.860	6.25
La	1827	3710	3130	2820	2490	4350	3300	2530	1805	2090	1901	2110	1727	1630	1914
Ce	5180	10700	8970	7970	6670	11300	7620	6510	4700	6140	5350	6030	4140	3690	4900
Pr	623	1275	914	979	791	1314	769	614	559	792	658	760	472	435	604
Nd	2380	4440	3260	3740	2880	5090	2790	2250	2130	3130	2550	3000	1798	1610	2330
Sm	317	563	468	470	350	687	387	313	300	434	364	417	259	241	332
Eu	78.2	126.9	113.2	100.6	73.2	165.1	100	84.1	73.5	96.2	83.5	95.2	64.8	61.5	78.6
Gd	176.6	265	269	234	171.6	353	216	160.4	173.1	222	201	221	152.2	146.3	186.7
Tb	17.41	26.3	26.1	21.8	15.12	37.4	25.4	16.43	17.03	21.4	19.5	21.3	16.23	14.78	18.59
Dy	70.5	122.5	118.3	86.7	59.4	147.4	107.1	78.2	73	85.9	79.9	87.8	66.4	63.9	78.6
Ho	9.19	16.54	15.14	10.88	6.90	18.4	14.46	10.63	9.85	10.87	10.3	11.02	8.89	8.68	10.06
Er	15.38	21.8	28.2	18.98	10.71	30	24.2	17.63	16.31	18.19	17.92	17.49	15.96	15.05	17.77
Tm	1.470	2.50	2.14	1.401	0.873	2.46	1.820	1.640	1.364	1.429	1.480	1.516	1.529	1.530	1.479
Yb	5.46	6.87	9.38	6.12	3.06	10.7	8.83	8.80	6.31	6.62	6.03	5.89	6.21	60	6.30
Lu	0.460	1.050	1.030	0.591	0.348	0.938	0.699	0.810	0.516	0.563	0.723	0.497	0.549	0.612	0.621
Hf	11.16	185.9	74.3	37.7	50.5	68.3	60.7	60.6	10.68	13.6	12.21	13.56	14.48	16.03	16.98
Ta	519	1390	322	1222	369	597	210	141.6	490	937	641	907	365	352	591
Th	425	1999	327	2390	765	843	614	410	260	989	471	876	188.2	172.7	457
U	204	198.9	243	191.3	92.6	377	125.3	72.5	211	317	252	305	162.8	156.1	233
REE	10700	21300	17330	16460	13520	23500	15370	12600	9870	13040	11240	12780	8730	7930	10480
LREE	10580	21100	17130	16320	13420	23300	15190	12470	9740	12900	11110	12630	8620	7820	10350
HREE	119.8	197.5	200	146.6	96.4	247	182.4	134.2	124.4	145	135.9	145.5	115.8	110.5	133.5
Ta+Nb	4850	56400	19710	21500	20900	20500	17470	14220	3590	4690	3990	4630	3430	3380	3970
Th+U	629	2200	570	2580	857	1220	739	482	470	1306	723	1181	351	329	690

A5.2. Trace-element composition of perovskite in the studied kimberlites. Data in ppm.

Label	728-4-G1_37	3/11/2016	3/12/2016	1/03/2013	1/04/2018	1/04/2019	4-21b	1/06/2026	1/06/2028	1/01/1931	1/01/1933	13b-A1_01	13b-A2_09	13b-A4_13	13b-B1_15
Kimberlite	Mulepe 2	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 2	Lucapa 2	Cat115	Cat115	Cat115	Cat115
Spot size (μm)	20	15	20	20	20	15	15	15	25	20	10	20	30	40	20
Texture	gm	necklace	gm	necklace	necklace	necklace	necklace	necklace	necklace	gm	gm	necklace	necklace	necklace	gm
Zoning	-	-	-	-	-	-	-	-	-	-	-	-	-	oscillatory	reverse
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia
Na	2750	1979	2190	2620	2240	2080	2750	1929	1863	2200	2380	483	3330	2020	3250
Mg	554	17080	783	338	714	7080	316	563	420	1851	2960	119.6	22600	1695	10530
K	67.3	127.6	52.2	62.2	145.9	117.6	71.7	163.9	63.7	71.3	67.1	11.85	201	80	112.5
Sc	4.90	5.46	4.15	3.85	4.32	4.55	3.94	3.89	4.90	4.31	3.99	0.648	8.16	90	6.69
V	149.4	110.3	104.7	106.3	109.5	119.4	106.1	105.9	99.7	108.5	103.5	10.65	102.5	86.2	98.8
Fe	6760	13830	6610	6720	6710	13930	7250	7730	7040	7020	7070	657	14070	8550	9190
Rb	0.0810	0.556	<0.034	0.0730	0.364	0.660	0.0560	10	0.0710	0.1130	0.0860	bd	1.20	0.320	0.501
Sr	1084	1334	1189	1186	1133	1266	1173	1252	1230	1163	1124	124.8	1302	1506	1234
Y	246	211	222	227	228	230	236	211	217	224	220	27.4	275	232	251
Zr	401	786	414	424	378	440	450	500	558	390	420	64.3	1057	1169	699
Nb	5170	4890	4070	4480	4400	4500	4300	4920	4520	3910	4220	645	7640	6190	6230
Ba	2.46	60.7	2.17	3.20	4.63	20.2	4.32	39.5	15.55	8.25	8.60	0.709	5.56	14.85	6.11
La	3000	2850	3190	3270	3380	3310	3150	3270	3100	3350	3200	593	5850	3610	5320
Ce	8800	6600	8120	8790	9560	10210	8280	8700	7300	9050	8360	1638	15020	6310	13960
Pr	1164	761	971	1081	1184	1177	1008	1002	836	1149	998	205	1767	636	1701
Nd	4490	2840	3600	4160	4580	4540	3810	3810	3210	4280	3820	750	6440	2220	5940
Sm	610	403	506	555	609	577	522	515	447	569	527	92.8	817	323	768
Eu	137	95.8	116.4	124.6	139.2	140.8	123	119.2	105.4	128.5	124.5	19.41	177.6	87.5	168.4
Gd	320	233	271	286	314	314	284	270	256	292	279	42.3	381	208	360
Tb	30	23.4	26.3	28.3	30.5	31.3	27.7	25.2	24.3	28.4	28.2	3.78	34.8	21.5	33.3
Dy	123.9	94	104	108.8	120.9	131.1	113.2	108.1	99.4	111.9	107.7	14.82	138.3	92.9	128.8
Ho	15.75	12.43	13.98	13.81	14.51	15.55	14.19	13.41	13.57	13.91	14.35	1.731	16.92	12.76	15.72
Er	24.4	22.1	23	22.5	24.5	26.6	25.1	22.8	21.1	23.5	21.7	2.75	27	22.8	25.7
Tm	2.08	1.750	1.930	2.02	2.37	2.42	2.29	1.730	2.26	1.872	20	0.249	2.37	2.03	2.23
Yb	9.12	7.25	7.52	8.12	10.7	7.75	8.58	7.63	8.05	7.33	8.10	0.956	10.18	8.10	9.65
Lu	0.857	0.550	0.627	0.615	0.853	1.090	0.727	0.743	0.688	0.738	0.756	0.0982	0.895	0.791	0.775
Hf	17.47	25.1	19.4	19.52	18.85	23	20	22.5	23.2	16.23	18.3	3.56	57.4	61.9	38.1
Ta	1370	535	647	824	982	892	738	735	537	780	724	174.6	1188	281	1162
Th	1555	386	539	1029	1584	1117	758	691	233	827	684	640	2020	54.3	1997
U	437	157.4	159.5	184.8	236	232	176.4	187.7	143.1	185.3	175	23.1	176.7	74.2	178.2
REE	18730	13940	16960	18460	19970	20500	17370	17870	15430	19000	17490	3370	30700	13560	28400
LREE	18520	13780	16780	18280	19770	20300	17180	17690	15260	18820	17310	3340	30500	13400	28200
HREE	206	161.5	177.3	184.2	204	216	191.7	179.5	169.4	187.7	182.9	24.4	230	160.9	216
Ta+Nb	6540	5430	4720	5300	5380	5390	5040	5650	5060	4690	4940	820	8830	6470	7390
Th+U	1992	544	698	1213	1820	1348	935	879	376	1012	859	663	2190	128.5	2180

A5.2. Trace-element composition of perovskite in the studied kimberlites. Data in ppm.

Label	13b-D1_24	13b-F1_32	13c-B1_42	13c-C1_45	13c-C1_48	13c-C1_49	13c-D1_52	13c-D1_55	13c-D2_58C	13c-F1_62	13c-G1_65	13c-G1_66	816-3-A1_02	816-3-C1_07
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Calonda	Calonda
Spot size (μm)	35	30	20	25	25	25	10 (crack)	20	20	15	15	15	10	10
Texture	necklace	necklace	necklace	necklace	necklace	gm	gm	necklace	gm	necklace	gm	necklace	gm	gm
Zoning	-	-	-	-	-	normal	-	-	-	-	-	-	-	-
Type	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia	Ia
Na	4800	2820	3480	2000	5050	3180	2060	3390	3090	2640	2600	3110	5270	5550
Mg	3030	12430	699	5140	685	3280	5900	8680	4110	5500	1664	401	35200	20100
K	127.8	132.2	86.7	65.6	122.3	101	72.9	485	254	130	70.4	71.2	2980	1672
Sc	6.39	10.18	6.54	9.21	7.66	8.32	7.50	8.88	9.55	6.40	7.70	7.16	9.02	6.96
V	106.4	93.4	97	99.6	100.6	99	85.2	92.3	93.9	107.9	87.6	97.2	124.7	126.4
Fe	7290	12010	7390	11120	7830	8200	8090	11090	10760	11740	7730	7200	23700	16060
Rb	0.1170	0.285	0.0960	0.1860	0.0640	0.170	0.1160	4.58	0.989	0.432	<0.0213	<0.021	7.64	7.89
Sr	1262	1465	1271	1383	1324	1337	1342	1265	1359	1319	1301	1240	1543	2150
Y	255	261	260	250	286	275	234	274	282	230	231	279	276	278
Zr	516	1829	720	1109	880	891	973	1617	1558	658	866	1101	1229	1179
Nb	5950	6860	6510	6920	6990	6770	5640	7590	7850	5460	5940	7860	17480	16030
Ba	5.91	29.6	6.36	7.37	7.67	10.74	8.40	12.59	11.14	7.88	8.44	5.24	67.4	167.8
La	5300	5010	5350	4840	5720	5380	4160	5510	5220	4470	4640	5990	5830	6030
Ce	14290	11030	13320	10760	13700	12450	8420	12880	11070	9880	10700	15480	13850	13710
Pr	1751	1218	1630	1068	1639	1532	923	1486	1281	1110	1250	1904	1449	1591
Nd	6530	4310	5890	3820	5960	5320	3190	5340	4470	3970	4450	6610	5240	5420
Sm	815	584	727	508	760	686	431	695	596	524	558	825	666	676
Eu	172.9	136	161.6	126.6	165.7	154.7	106.1	156.3	141	120.3	131.8	182.3	160.3	152.2
Gd	380	302	363	269	384	355	250	358	322	276	298	406	345	344
Tb	34.7	29.4	33.1	29.2	36.1	32.7	24.8	33	31.6	26	28	37.3	35.3	32.5
Dy	132.6	120.9	130.7	113.8	139.9	130.5	103.4	135	128.2	105.8	114.3	145.3	141.2	133.2
Ho	16.07	15.4	15.55	14.2	17.89	16.31	13.41	16.82	16.93	13.61	13.3	18.41	17.47	17.45
Er	25.1	25.1	25	25.4	28.2	27.2	22.6	28.6	29.2	21.3	22.7	28.9	29.4	28
Tm	2.20	2.22	2.13	2.46	2.40	2.37	1.883	2.31	2.57	1.790	2.05	2.45	2.66	2.38
Yb	9.43	10.44	9.42	10.04	10.51	9.06	7.61	9.35	9.56	8.50	7.47	11.39	10.85	9.37
Lu	0.872	0.925	0.807	0.673	0.938	0.746	0.892	0.722	1.061	0.739	0.731	0.835	0.836	0.931
Hf	28.8	92.7	39.7	64.7	47.9	49	52.6	84	85.4	35.5	45.4	65.4	64.3	51.5
Ta	1465	599	1237	450	1212	1024	447	899	685	659	853	1466	550	903
Th	4520	512	2540	120.3	2390	1573	176.5	1174	387	522	1560	2270	745	1773
U	190.1	112.5	154.4	99.7	169.6	152.2	90.4	138.1	118.7	106.4	134.8	184.3	397	333
REE	29500	22800	27700	21600	28600	26100	17660	26600	23300	20500	22200	31600	27800	28100
LREE	29200	22600	27400	21400	28300	25900	17480	26400	23100	20400	22000	31400	27500	27900
HREE	221	204	217	195.7	236	219	174.6	226	219	177.8	188.5	245	238	224
Ta+Nb	7420	7460	7740	7360	8200	7790	6080	8490	8540	6120	6800	9330	18030	16940
Th+U	4710	625	2690	220	2560	1726	267	1312	505	628	1695	2460	1143	2110

A5.3. U-Pb isotope data of perovskites in the studied kimberlites

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Analysis No.	$^{207}Pb/^{206}Pb$	+/-2s	$^{207}Pb/^{235}U$	+/-2s	$^{206}Pb/^{238}U$	+/-2s	$^{208}Pb/^{232}Th$	+/-2s
MGR-13b-A1-01	0.3484	0.0123	1.836	0.06064	0.0382	0.0011	0.0071	0.0002
MGR-13b-A1-05	0.2654	0.0135	1.124	0.05295	0.0307	0.0012	0.0066	0.0003
MGR-13b-A1-06	0.2700	0.0177	1.056	0.06175	0.0283	0.0013	0.0058	0.0003
MGR-13b-A3-10	0.3198	0.0398	1.517	0.15449	0.0344	0.0029	0.0100	0.0008
MGR-13b-B2-18	0.4136	0.0287	2.385	0.13981	0.0418	0.0022	0.0095	0.0005
MGR-13b-C2-23	0.3163	0.0294	1.363	0.10516	0.0312	0.0020	0.0075	0.0005
MGR-13b-E1-28	0.3352	0.0466	1.646	0.18507	0.0358	0.0032	0.0128	0.0013
MGR-13b-F1-30	0.4521	0.0376	3.104	0.20893	0.0498	0.0031	0.0420	0.0028
MGR-13b-F1-31	0.3142	0.0212	1.489	0.08766	0.0344	0.0017	0.0079	0.0004
MGR-13b-F1-36	0.3889	0.0364	2.105	0.15912	0.0393	0.0026	0.0372	0.0026
MGR-31b_A_92	0.2712	0.0122	1.143	0.04998	0.0306	0.0011	0.0067	0.0003
MGR-31b_A_94	0.2812	0.0144	1.243	0.06129	0.0321	0.0012	0.0072	0.0004
MGR-31b_A_91	0.2849	0.0120	1.249	0.05017	0.0318	0.0010	0.0065	0.0003
MGR-31b_A_96	0.2733	0.0111	1.207	0.04668	0.0320	0.0010	0.0062	0.0003
MGR-31b_B_98	0.2641	0.0132	1.176	0.05613	0.0323	0.0011	0.0067	0.0004
MGR-31b_B_101	0.2898	0.0286	1.380	0.12079	0.0345	0.0021	0.0072	0.0007
MGR-31b_B_102	0.2587	0.0131	1.050	0.05120	0.0294	0.0011	0.0064	0.0004
MGR-31b_C_105	0.3263	0.0255	1.617	0.11328	0.0359	0.0018	0.0089	0.0008
MGR-31b_C_107	0.3650	0.0347	1.839	0.15428	0.0365	0.0022	0.0219	0.0025
MGR-31b_C_109	0.2843	0.0158	1.320	0.06775	0.0337	0.0012	0.0078	0.0006
MGR-31b_D_113	0.2794	0.0244	1.120	0.09045	0.0291	0.0015	0.0064	0.0008
MGR-31b_E_119	0.2724	0.0150	1.213	0.06291	0.0323	0.0011	0.0069	0.0005
MGR-31b_E_117	0.3002	0.0201	1.279	0.07923	0.0309	0.0012	0.0069	0.0007
MGR-31b_E_118	0.3002	0.0231	1.346	0.09588	0.0325	0.0015	0.0079	0.0008

AGES (Ma)

Analysis No.	$^{207}Pb/^{206}Pb$	+/-2s	$^{207}Pb/^{235}U$	+/-2s	$^{206}Pb/^{238}U$	+/-2s	$^{208}Pb/^{232}Th$	+/-2s
MGR-13b-A1-01	3700	53	1058	22	242	7	143	4
MGR-13b-A1-05	3279	79	765	25	195	7	133	5
MGR-13b-A1-06	3306	101	732	31	180	8	117	5
MGR-13b-A3-10	3569	185	937	62	218	18	201	17
MGR-13b-B2-18	3959	102	1238	42	264	14	190	10
MGR-13b-C2-23	3552	139	873	45	198	13	151	9
MGR-13b-E1-28	3641	205	988	71	227	20	257	25
MGR-13b-F1-30	4092	121	1434	52	313	19	832	54
MGR-13b-F1-31	3542	102	926	36	218	11	158	7
MGR-13b-F1-36	3867	138	1151	52	248	16	737	52
MGR-31b_A_92	3313	70	774	24	194	7	136	7
MGR-31b_A_94	3370	79	820	28	203	8	145	9
MGR-31b_A_91	3390	65	823	23	202	6	131	7
MGR-31b_A_96	3325	63	804	21	203	6	126	6
MGR-31b_B_98	3271	77	790	26	205	7	134	8
MGR-31b_B_101	3417	149	881	52	219	13	145	15
MGR-31b_B_102	3239	79	729	25	187	7	129	8
MGR-31b_C_105	3600	118	977	44	228	11	178	16
MGR-31b_C_107	3771	141	1060	55	231	14	437	49
MGR-31b_C_109	3387	85	855	30	214	8	156	11
MGR-31b_D_113	3360	133	763	43	185	9	130	15
MGR-31b_E_119	3320	85	807	29	205	7	140	11
MGR-31b_E_117	3471	102	836	35	196	8	140	14
MGR-31b_E_118	3471	117	866	42	206	10	159	17

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NORMAL CONCORDIA PLOT DATA

Analysis No.	$^{207}Pb/^{235}U$	1s	$^{206}Pb/^{238}U$	1s
MGR-13b-A1-01	1.8359	0.0303	0.0382	0.0006
MGR-13b-A1-05	1.1241	0.0265	0.0307	0.0006
MGR-13b-A1-06	1.0559	0.0309	0.0283	0.0007
MGR-13b-A3-10	1.5166	0.0772	0.0344	0.0014
MGR-13b-B2-18	2.3848	0.0699	0.0418	0.0011
MGR-13b-C2-23	1.3629	0.0526	0.0312	0.0010
MGR-13b-E1-28	1.6455	0.0925	0.0358	0.0016
MGR-13b-F1-30	3.1039	0.1045	0.0498	0.0016
MGR-13b-F1-31	1.4887	0.0438	0.0344	0.0009
MGR-13b-F1-36	2.1053	0.0796	0.0393	0.0013
MGR-31b_A_92	1.1430	0.0250	0.0306	0.0005
MGR-31b_A_94	1.2432	0.0306	0.0321	0.0006
MGR-31b_A_91	1.2492	0.0251	0.0318	0.0005
MGR-31b_A_96	1.2066	0.0233	0.0320	0.0005
MGR-31b_B_98	1.1761	0.0281	0.0323	0.0006
MGR-31b_B_101	1.3803	0.0604	0.0345	0.0011
MGR-31b_B_102	1.0499	0.0256	0.0294	0.0005
MGR-31b_C_105	1.6173	0.0566	0.0359	0.0009
MGR-31b_C_107	1.8390	0.0771	0.0365	0.0011
MGR-31b_C_109	1.3202	0.0339	0.0337	0.0006
MGR-31b_D_113	1.1199	0.0452	0.0291	0.0008
MGR-31b_E_119	1.2134	0.0315	0.0323	0.0006
MGR-31b_E_117	1.2788	0.0396	0.0309	0.0006
MGR-31b_E_118	1.3462	0.0479	0.0325	0.0008

INVERSE CONCORDIA PLOT DATA

$^{238}U/^{206}Pb$	RSD	$^{207}Pb/^{206}Pb$	RSD
26.151	1.4818	0.3484	1.7610
32.539	1.9013	0.2654	2.5418
35.284	2.3235	0.2700	3.2697
29.105	4.1574	0.3198	6.2291
23.928	2.6492	0.4136	3.4749
32.018	3.2682	0.3163	4.6415
27.959	4.5143	0.3352	6.9559
20.099	3.1542	0.4521	4.1637
29.105	2.4845	0.3142	3.3770
25.474	3.3012	0.3889	4.6762
32.708	1.7507	0.2712	2.2448
31.190	1.9175	0.2812	2.5685
31.442	1.5821	0.2849	2.1141
31.230	1.5273	0.2733	2.0252
30.959	1.7781	0.2641	2.4969
28.946	3.1015	0.2898	4.9369
33.964	1.7955	0.2587	2.5365
27.821	2.5555	0.3263	3.9125
27.361	3.0439	0.3650	4.7594
29.695	1.8188	0.2843	2.7793
34.400	2.5842	0.2794	4.3684
30.949	1.7489	0.2724	2.7495
32.362	2.0186	0.3002	3.3515
30.747	2.3509	0.3002	3.8534

A5.3. U-Pb isotope data of perovskites in the studied kimberlites

MULEPE 1	RATIOS							
Analysis No.	$^{207}Pb/^{206}Pb$	+/-2s	$^{207}Pb/^{235}U$	+/-2s	$^{206}Pb/^{238}U$	+/-2s	$^{208}Pb/^{232}Th$	+/-2s
EII-705-2d-A2-07	0.1680	0.0090	0.490	0.02572	0.0212	0.0007	0.0053	0.0004
EII-705-2d-A2-09	0.1992	0.0133	0.648	0.04142	0.0236	0.0009	0.0068	0.0006
EII-705-2d-A2-10	0.1699	0.0093	0.497	0.02683	0.0212	0.0007	0.0050	0.0004
EII-705-2d-B1-14	0.2589	0.0217	0.952	0.07382	0.0267	0.0013	0.0083	0.0009
EII-705-2d-B1-15	0.2408	0.0323	0.916	0.11038	0.0276	0.0020	0.0142	0.0022
EII-705-2d-C1-17	0.1484	0.0097	0.434	0.02780	0.0212	0.0008	0.0047	0.0004
EII-705-2d-C1-20	0.1506	0.0220	0.469	0.06347	0.0226	0.0015	0.0038	0.0006
EII-705-2d-E1-28	0.2556	0.0202	0.895	0.06734	0.0254	0.0011	0.0067	0.0008
EII-708-2_A_01	0.2615	0.0127	1.021	0.04775	0.0283	0.0010	0.3770	0.0239
EII-708-2_A_03	0.1560	0.0120	0.516	0.03778	0.0240	0.0011	0.0075	0.0007
EII-708-2_B_10	0.1635	0.0205	0.560	0.06341	0.0249	0.0017	0.0099	0.0012
EII-708-2_C_15	0.1562	0.0112	0.495	0.03399	0.0230	0.0010	0.0070	0.0006
EII-708-2_D_16	0.1696	0.0129	0.535	0.03890	0.0229	0.0010	0.0064	0.0006
EII-708-2_D_17	0.1535	0.0191	0.493	0.05591	0.0233	0.0015	0.0051	0.0007
EII-708-2_D_18	0.1869	0.0204	0.664	0.06666	0.0258	0.0015	0.0106	0.0014
EII-708-2_D_X	0.1578	0.0141	0.540	0.04585	0.0248	0.0012	0.0072	0.0009
EII-708-2_D_19	0.1601	0.0108	0.494	0.03249	0.0224	0.0009	0.0068	0.0007
EII-708-2_G_21	0.1565	0.0103	0.490	0.03160	0.0227	0.0009	0.0076	0.0007
EII-707-1-B1-16	0.2241	0.0191	0.795	0.06226	0.0257	0.0014	0.0118	0.0012
EII-707-1-C1-21	0.1467	0.0071	0.430	0.02089	0.0212	0.0007	0.0062	0.0004
EII-707-1-D1-30	0.1350	0.0084	0.393	0.02453	0.0211	0.0008	0.0061	0.0005
EII-707-1-E1-33	0.1845	0.0118	0.590	0.03688	0.0232	0.0009	0.0076	0.0007
EII-707-1-G1-45	0.1635	0.0169	0.578	0.05633	0.0257	0.0014	0.0091	0.0013
EII-707-1-G2-49	0.2021	0.0100	0.669	0.03265	0.0240	0.0008	0.0087	0.0006
EII-707-1-E1-34	0.3518	0.0329	1.829	0.15476	0.0377	0.0022	0.3924	0.0524
EII-707-1-F1-38	0.1729	0.0105	0.540	0.03310	0.0227	0.0009	0.0071	0.0007
EII-707-1-F1-48	0.2543	0.0374	0.931	0.12569	0.0266	0.0021	0.0133	0.0032

	AGES(Ma)							
Analysis No.	$^{207}Pb/^{206}Pb$	+/-2s	$^{207}Pb/^{235}U$	+/-2s	$^{206}Pb/^{238}U$	+/-2s	$^{208}Pb/^{232}Th$	+/-2s
EII-705-2d-A2-07	2537	88	404.8	18	134.9	5	107.7	7
EII-705-2d-A2-09	2820	107	507.2	26	150.3	6	137.0	12
EII-705-2d-A2-10	2556.5	91	409.7	18	135.4	5	101.6	8
EII-705-2d-B1-14	3240.2	129	679.3	38	169.8	8	166.7	18
EII-705-2d-B1-15	3125.3	206	660.2	59	175.5	13	285.2	44
EII-705-2d-C1-17	2327.0	110	366.2	20	135.4	5	95.0	9
EII-705-2d-C1-20	2352.8	239	390.7	44	144.1	10	76.6	13
EII-705-2d-E1-28	3220.0	122	649.2	36	161.7	7	135.6	15
EII-708-2_A_01	3256	76	714	24	180	6	6467	351
EII-708-2_A_03	2413	128	423	25	153	7	152	14
EII-708-2_B_10	2492	204	452	41	158	11	199	25
EII-708-2_C_15	2415	119	408	23	147	6	141	13
EII-708-2_D_16	2554	124	435	26	146	6	128	13
EII-708-2_D_17	2386	205	407	38	149	10	102	14
EII-708-2_D_18	2715	175	517	41	164	10	214	29
EII-708-2_D_X	2432	148	438	30	158	8	145	18
EII-708-2_D_19	2456	111	408	22	143	6	137	13
EII-708-2_G_21	2418	109	405	22	145	6	153	15
EII-707-1-B1-16	3011	134	594	35	164	9	238	24
EII-707-1-C1-21	2307	82	363	15	136	4	125	8
EII-707-1-D1-30	2164	107	337	18	135	5	123	11
EII-707-1-E1-33	2694	104	471	24	148	6	152	13
EII-707-1-G1-45	2492	169	463	36	163	9	184	25
EII-707-1-G2-49	2843	79	520	20	153	5	176	12
EII-707-1-E1-34	3715	139	1056	56	239	14	6691	761
EII-707-1-F1-38	2586	99	439	22	145	6	144	14
EII-707-1-F1-48	3212	224	668	66	169	13	267	63

A5.3. U-Pb isotope data of perovskites in the studied kimberlites

MULEPE 1	NORMAL CONCORDIA PLOT DATA				INVERSE CONCORDIA PLOT DATA			
Analysis No.	$^{207}Pb/^{235}U$	1s	$^{206}Pb/^{238}U$	1s	$^{238}U/^{206}Pb$	RSD	$^{207}Pb/^{206}Pb$	RSD
EII-705-2d-A2-07	0.4898	0.0129	0.0212	0.0004	47.279	1.7163	0.1680	2.6702
EII-705-2d-A2-09	0.6479	0.0207	0.0236	0.0005	42.393	1.9485	0.1992	3.3481
EII-705-2d-A2-10	0.4971	0.0134	0.0212	0.0004	47.117	1.7003	0.1699	2.7460
EII-705-2d-B1-14	0.9523	0.0369	0.0267	0.0006	37.469	2.3603	0.2589	4.1886
EII-705-2d-B1-15	0.9160	0.0552	0.0276	0.0010	36.239	3.6456	0.2408	6.7141
EII-705-2d-C1-17	0.4343	0.0139	0.0212	0.0004	47.104	1.8527	0.1484	3.2701
EII-705-2d-C1-20	0.4693	0.0317	0.0226	0.0008	44.243	3.4055	0.1506	7.3019
EII-705-2d-E1-28	0.8953	0.0337	0.0254	0.0005	39.365	2.1527	0.2556	3.9579
EII-708-2_A_01	1.0206	0.0239	0.0283	0.0005	35.298	1.7793	0.2615	2.4371
EII-708-2_A_03	0.5162	0.0189	0.0240	0.0005	41.686	2.2476	0.1560	3.8384
EII-708-2_B_10	0.5602	0.0317	0.0249	0.0008	40.224	3.4073	0.1635	6.2682
EII-708-2_C_15	0.4952	0.0170	0.0230	0.0005	43.507	2.1244	0.1562	3.5705
EII-708-2_D_16	0.5348	0.0195	0.0229	0.0005	43.720	2.2333	0.1696	3.7983
EII-708-2_D_17	0.4933	0.0280	0.0233	0.0008	42.921	3.3068	0.1535	6.2231
EII-708-2_D_18	0.6643	0.0333	0.0258	0.0008	38.773	2.9776	0.1869	5.4692
EII-708-2_D_X	0.5396	0.0229	0.0248	0.0006	40.307	2.4252	0.1578	4.4643
EII-708-2_D_19	0.4942	0.0162	0.0224	0.0004	44.642	1.9714	0.1601	3.3597
EII-708-2_G_21	0.4899	0.0158	0.0227	0.0004	44.030	1.9434	0.1565	3.2800
EII-707-1-B1-16	0.7947	0.0311	0.0257	0.0007	38.884	2.6735	0.2241	4.2568
EII-707-1-C1-21	0.4296	0.0104	0.0212	0.0003	47.065	1.6329	0.1467	2.4333
EII-707-1-D1-30	0.3933	0.0123	0.0211	0.0004	47.307	1.9476	0.1350	3.1239
EII-707-1-E1-33	0.5895	0.0184	0.0232	0.0005	43.134	2.0421	0.1845	3.19473
EII-707-1-G1-45	0.5781	0.0282	0.0257	0.0007	38.982	2.8126	0.1635	5.1696
EII-707-1-G2-49	0.6693	0.0163	0.0240	0.0004	41.632	1.6766	0.2021	2.4718
EII-707-1-E1-34	1.8292	0.0774	0.0377	0.0011	26.511	2.9421	0.3518	4.6833
EII-707-1-F1-38	0.5402	0.0166	0.0227	0.0004	44.114	1.9288	0.1729	3.0285
EII-707-1-F1-48	0.9311	0.0628	0.0266	0.0010	37.648	3.8957	0.2543	7.3639

A5.3. U-Pb isotope data of perovskites in the studied kimberlites

MULEPE 2	RATIOS							
Analysis No.	$^{207}Pb/^{206}Pb$	+/-2s	$^{207}Pb/^{235}U$	+/-2s	$^{206}Pb/^{238}U$	+/-2s	$^{208}Pb/^{232}Th$	+/-2s
EII-728-4-A1-05	0.1214	0.0061	0.327	0.01602	0.0196	0.0007	0.0052	0.0002
EII-728-4-B1-07	0.1854	0.0160	0.548	0.04202	0.0214	0.0011	0.0067	0.0004
EII-728-4-B1-09	0.1920	0.0206	0.596	0.05644	0.0226	0.0014	0.0063	0.0005
EII-728-4-B2-14	0.1247	0.0061	0.340	0.01601	0.0197	0.0006	0.0051	0.0002
EII-728-4-C1-17	0.1407	0.0133	0.428	0.03672	0.0221	0.0012	0.0064	0.0004
EII-728-4-D1-21	0.1354	0.0186	0.390	0.04778	0.0209	0.0015	0.0051	0.0005
EII-728-4-D1-22	0.1278	0.0064	0.374	0.01801	0.0212	0.0007	0.0058	0.0002
EII-728-4-D1-25	0.1519	0.0126	0.456	0.03410	0.0218	0.0010	0.0071	0.0005
EII-728-4-E1-29	0.1329	0.0071	0.373	0.01895	0.0204	0.0007	0.0058	0.0003
EII-728-4-F2-36	0.1290	0.0077	0.393	0.02225	0.0221	0.0008	0.0062	0.0003
EII-728-4-H1-39	0.1767	0.0243	0.568	0.06859	0.0233	0.0017	0.0115	0.0012
EII-728-4-H1-40	0.1535	0.0197	0.455	0.05217	0.0215	0.0015	0.0070	0.0007
EII-723-1-D1-14	0.1469	0.0124	0.469	0.03563	0.0232	0.0011	0.0087	0.0004
EII-723-2-A1-2	0.2251	0.0199	0.829	0.06659	0.0267	0.0015	0.0120	0.0011
EII-723-2-A1-4	0.4796	0.0622	2.600	0.27514	0.0394	0.0035	0.0980	0.0135
EII-723-2-B1-7	0.5686	0.0643	4.260	0.39885	0.0544	0.0043	0.0907	0.0124
EII-720-2-A1-1	0.1415	0.0085	0.416	0.02435	0.0213	0.0008	0.0074	0.0006
EII-720-2-B2-8	0.1928	0.0207	0.637	0.06338	0.0240	0.0014	0.0100	0.0013
EII-720-2-C2-13B	0.1957	0.0208	0.706	0.06899	0.0262	0.0016	0.0129	0.0016
EII-720-2-D1-14	0.1296	0.0055	0.422	0.01793	0.0236	0.0007	0.0071	0.0004
EII-720-2-D1-14B	0.2123	0.0158	0.799	0.05467	0.0273	0.0012	0.0108	0.0010
EII-720-2-D1-16	0.2441	0.0175	0.931	0.06241	0.0277	0.0012	0.0145	0.0014
EII-720-2-D2-18	0.1642	0.0127	0.524	0.03903	0.0231	0.0010	0.0090	0.0009
EII-720-2-E1-22	0.1664	0.0148	0.559	0.04713	0.0244	0.0012	0.0091	0.0011
EII-720-2-E1-24	0.4138	0.0343	1.984	0.15497	0.0348	0.0017	0.0407	0.0054
EII-720-2-E1-26	0.3662	0.0387	1.626	0.16187	0.0322	0.0019	0.0144	0.0025
EII-720-1-b-1	0.4382	0.0250	2.423	0.11223	0.0401	0.0015	0.0193	0.0013
EII-720-1-b-c-12	0.2307	0.0082	0.777	0.02429	0.0244	0.0005	0.0101	0.0005
EII-720-1-b-c-15	0.4171	0.0229	2.417	0.11176	0.0420	0.0014	0.0171	0.0013
EII-720-1-c-38	0.3016	0.0136	1.197	0.04725	0.0288	0.0007	0.0157	0.0010
EII-720-1-d-52	0.3986	0.0204	1.991	0.08502	0.0362	0.0011	0.0189	0.0013
EII-720-1-d-57	0.4982	0.0434	3.366	0.23268	0.0490	0.0028	0.0336	0.0035
EII-720-1-d-58	0.5514	0.0374	3.869	0.21017	0.0509	0.0022	0.0167	0.0015
EII-720-1-d-55	0.4632	0.0236	2.657	0.11737	0.0416	0.0012	0.0164	0.0013
EII-720-1-e-40	0.5263	0.0217	3.242	0.12042	0.0447	0.0010	0.0189	0.0014
EII-720-1-e-41	0.2896	0.0122	1.111	0.04150	0.0278	0.0006	0.0156	0.0010

	AGES(Ma)							
Analysis No.	$^{207}Pb/^{206}Pb$	+/-2s	$^{207}Pb/^{235}U$	+/-2s	$^{206}Pb/^{238}U$	+/-2s	$^{208}Pb/^{232}Th$	+/-2s
EII-728-4-A1-05	1977	88	288	12	125	4	104	4
EII-728-4-B1-07	2702	139	444	28	137	7	134	8
EII-728-4-B1-09	2759	171	475	36	144	9	127	10
EII-728-4-B2-14	2025	85	297	12	126	4	103	4
EII-728-4-C1-17	2236	159	362	26	141	7	129	9
EII-728-4-D1-21	2169	230	334	35	133	10	102	10
EII-728-4-D1-22	2068	87	323	13	136	4	116	5
EII-728-4-D1-25	2367	138	381	24	139	6	143	9
EII-728-4-E1-29	2137	92	322	14	130	4	117	5
EII-728-4-F2-36	2085	104	336	16	141	5	124	6
EII-728-4-H1-39	2622	220	456	44	148	11	231	25
EII-728-4-H1-40	2386	210	381	36	137	9	141	13
EII-723-1-D1-14	2311	142	390	25	148	7	174	8
EII-723-2-A1-2	3017	139	613	37	170	9	241	22
EII-723-2-A1-4	4180	185	1301	78	249	22	1890	249
EII-723-2-B1-7	4430	160	1686	77	341	26	1755	229
EII-720-2-A1-1	2246	102	353	17	136	5	150	12
EII-720-2-B2-8	2766	171	500	39	153	9	200	27
EII-720-2-C2-13B	2791	169	543	41	167	10	260	32
EII-720-2-D1-14	2093	73	358	13	151	4	143	8
EII-720-2-D1-14B	2924	118	596	31	174	7	218	21
EII-720-2-D1-16	3147	111	668	33	176	8	292	27
EII-720-2-D2-18	2500	127	428	26	148	6	180	19
EII-720-2-E1-22	2522	145	451	31	155	8	184	22
EII-720-2-E1-24	3960	122	1110	53	220	11	806	105
EII-720-2-E1-26	3776	156	980	63	204	12	290	50
720-1-b-1	4046	84	1250	33	254	9	386	26
720-1-b-c-12	3057	56	584	14	156	3	204	10
720-1-b-c-15	3972	81	1248	33	266	9	342	26
720-1-c-38	3479	69	799	22	183	5	315	20
720-1-d-52	3904	76	1112	29	229	7	379	25
720-1-d-57	4236	126	1496	54	309	17	669	69
720-1-d-58	4385	97	1607	44	320	14	335	29
720-1-d-55	4128	75	1317	33	263	7	328	26
720-1-e-40	4317	60	1467	29	282	6	378	27
720-1-e-41	3415	65	759	20	177	4	313	21

A5.3. U-Pb isotope data of perovskites in the studied kimberlites

MULEPE 2	NORMAL CONCORDIA PLOT DATA				INVERSE CONCORDIA PLOT DATA			
Analysis No.	$^{207}Pb/^{235}U$	1s	$^{206}Pb/^{238}U$	1s	$^{238}U/^{206}Pb$	RSD	$^{207}Pb/^{206}Pb$	RSD
EII-728-4-A1-05	0.3275	0.0080	0.0196	0.0003	51.118	1.668	0.121	2.518
EII-728-4-B1-07	0.5484	0.0210	0.0214	0.0006	46.655	2.570	0.185	4.304
EII-728-4-B1-09	0.5961	0.0282	0.0226	0.0007	44.339	3.142	0.192	5.378
EII-728-4-B2-14	0.3396	0.0080	0.0197	0.0003	50.636	1.631	0.125	2.429
EII-728-4-C1-17	0.4282	0.0184	0.0221	0.0006	45.285	2.631	0.141	4.716
EII-728-4-D1-21	0.3895	0.0239	0.0209	0.0008	47.866	3.630	0.135	6.873
EII-728-4-D1-22	0.3745	0.0090	0.0212	0.0003	47.060	1.610	0.128	2.518
EII-728-4-D1-25	0.4558	0.0170	0.0218	0.0005	45.934	2.259	0.152	4.133
EII-728-4-E1-29	0.3732	0.0095	0.0204	0.0003	49.104	1.669	0.133	2.685
EII-728-4-F2-36	0.3927	0.0111	0.0221	0.0004	45.309	1.812	0.129	2.997
EII-728-4-H1-39	0.5676	0.0343	0.0233	0.0009	42.936	3.661	0.177	6.875
EII-728-4-H1-40	0.4551	0.0261	0.0215	0.0007	46.432	3.412	0.154	6.407
EII-723-1-D1-14	0.4688	0.0178	0.0232	0.0005	43.176	2.295	0.147	4.226
EII-723-2-A1-2	0.8293	0.0333	0.0267	0.0007	37.429	2.725	0.225	4.430
EII-723-2-A1-4	2.6002	0.1376	0.0394	0.0017	25.406	4.427	0.480	6.487
EII-723-2-B1-7	4.2595	0.1994	0.0544	0.0021	18.394	3.947	0.569	5.657
EII-720-2-A1-1	0.4159	0.0122	0.0213	0.0004	46.913	1.861	0.142	3.003
EII-720-2-B2-8	0.6367	0.0317	0.0240	0.0007	41.743	2.958	0.193	5.363
EII-720-2-C2-13B	0.7063	0.0345	0.0262	0.0008	38.197	2.975	0.196	5.307
EII-720-2-D1-14	0.4222	0.0090	0.0236	0.0003	42.329	1.468	0.130	2.108
EII-720-2-D1-14B	0.7985	0.0273	0.0273	0.0006	36.667	2.164	0.212	3.714
EII-720-2-D1-16	0.9311	0.0312	0.0277	0.0006	36.145	2.249	0.244	3.580
EII-720-2-D2-18	0.5239	0.0195	0.0231	0.0005	43.213	2.220	0.164	3.871
EII-720-2-E1-22	0.5587	0.0236	0.0244	0.0006	41.059	2.454	0.166	4.438
EII-720-2-E1-24	1.9836	0.0775	0.0348	0.0009	28.758	2.491	0.414	4.144
EII-720-2-E1-26	1.6256	0.0809	0.0322	0.0009	31.054	2.905	0.366	5.279
EII-720-1-b-1	2.4232	0.0561	0.0401	0.0007	24.928	2.316	0.438	2.316
EII-720-1-b-c-12	0.7773	0.0121	0.0244	0.0002	40.924	1.563	0.231	1.563
EII-720-1-b-c-15	2.4172	0.0559	0.0420	0.0007	23.788	2.312	0.417	2.312
EII-720-1-c-38	1.1966	0.0236	0.0288	0.0004	34.755	1.974	0.302	1.974
EII-720-1-d-52	1.9906	0.0425	0.0362	0.0006	27.602	2.136	0.399	2.136
EII-720-1-d-57	3.3656	0.1163	0.0490	0.0014	20.399	3.457	0.498	3.457
EII-720-1-d-58	3.8691	0.1051	0.0509	0.0011	19.653	2.716	0.551	2.716
EII-720-1-d-55	2.6573	0.0587	0.0416	0.0006	24.031	2.208	0.463	2.208
EII-720-1-e-40	3.2419	0.0602	0.0447	0.0005	22.377	1.857	0.526	1.857
EII-720-1-e-41	1.1108	0.0208	0.0278	0.0003	35.942	1.868	0.290	1.868

A5.3. U-Pb isotope data of perovskites in the studied kimberlites

CALONDA

Analysis No.	RATIOS								AGES (Ma)							
	$^{207}Pb/^{206}Pb$	+/-2s	$^{207}Pb/^{235}U$	+/-2s	$^{206}Pb/^{238}U$	+/-2s	$^{208}Pb/^{232}Th$	+/-2s	$^{207}Pb/^{206}Pb$	+/-2s	$^{207}Pb/^{235}U$	+/-2s	$^{206}Pb/^{238}U$	+/-2s	$^{208}Pb/^{232}Th$	+/-2s
EII-816-1-a-5	0.2254	0.0064	0.784	0.02019	0.0252	0.0004	0.0070	0.0003	3020	45	588	11	161	3	140	6
EII-816-1-a-11	0.2649	0.0125	1.092	0.04453	0.0299	0.0008	0.0119	0.0008	3276	73	749	22	190	5	239	16
EII-816-1-a-15	0.3935	0.0115	2.046	0.05224	0.0377	0.0007	0.0275	0.0012	3884	44	1131	17	239	4	548	24
EII-816-1-a-18	0.5212	0.0286	3.699	0.16923	0.0514	0.0017	0.0187	0.0015	4302	79	1571	37	323	11	374	30
EII-816-1-a-18bo	0.4305	0.0129	2.611	0.06995	0.0440	0.0008	0.0251	0.0013	4019	45	1304	20	278	5	500	25
EII-816-1-a-22	0.4995	0.0238	3.912	0.15838	0.0568	0.0017	0.0176	0.0013	4240	69	1616	33	356	10	354	27
EII-816-1-a-30	0.5044	0.0140	3.851	0.09733	0.0554	0.0009	0.0116	0.0006	4254	41	1604	20	347	5	234	12
EII-816-1-b-32	0.2153	0.0066	0.741	0.02060	0.0250	0.0004	0.0075	0.0004	2946	49	563	12	159	3	152	7
EII-816-1-b-33	0.3085	0.0137	1.309	0.05122	0.0308	0.0008	0.0095	0.0007	3513	68	850	23	195	5	191	13
EII-816-1-b-34	0.3086	0.0106	1.382	0.04278	0.0325	0.0006	0.0093	0.0005	3514	53	881	18	206	4	187	11
EII-816-1-c-40	0.2550	0.0118	0.946	0.03861	0.0269	0.0007	0.0086	0.0006	3216	72	676	20	171	4	172	12
EII-816-1-c-41	0.2245	0.0062	0.796	0.02004	0.0257	0.0004	0.0071	0.0003	3013	44	594	11	164	3	143	6
EII-816-1-c-43	0.2045	0.0069	0.703	0.02169	0.0249	0.0004	0.0077	0.0004	2862	54	540	13	159	3	156	9
EII-816-1-c-46	0.2487	0.0127	0.987	0.04473	0.0288	0.0007	0.0112	0.0010	3177	80	697	23	183	5	226	20
EII-816-1-c-47	0.4234	0.0231	2.529	0.11920	0.0433	0.0013	0.0173	0.0017	3994	80	1281	34	273	8	346	33
EII-816-1-c-51	0.3547	0.0113	1.571	0.04493	0.0321	0.0006	0.0092	0.0005	3727	48	959	18	204	4	186	10
EII-816-1-c-53	0.2782	0.0102	1.113	0.03617	0.0290	0.0006	0.0078	0.0004	3353	56	760	17	184	4	158	8
EII-816-1-c-54	0.3658	0.0176	1.713	0.07191	0.0340	0.0010	0.0167	0.0012	3774	72	1013	27	216	6	336	24
EII-816-1-d-68	0.2587	0.0078	0.933	0.02505	0.0262	0.0005	0.0069	0.0003	3239	47	669	13	167	3	139	6
EII-816-1-d-69	0.2815	0.0085	1.085	0.02916	0.0280	0.0005	0.0080	0.0003	3371	46	746	14	178	3	161	7
EII-816-1-d-73	0.3738	0.0171	1.729	0.06983	0.0336	0.0009	0.0160	0.0012	3807	68	1020	26	213	6	322	23
EII-816-1-d-74	0.3830	0.0120	2.299	0.06233	0.0436	0.0009	0.0539	0.0026	3844	47	1212	19	275	5	1061	49
EII-816-1-d-76	0.3628	0.0144	1.674	0.05872	0.0335	0.0008	0.0132	0.0008	3762	60	999	22	212	5	265	17
EII-816-1-d-81	0.2763	0.0116	1.059	0.03962	0.0278	0.0007	0.0113	0.0007	3342	65	734	20	177	4	227	14
EII-816-1-d-85	0.2470	0.0076	0.906	0.02513	0.0266	0.0005	0.0081	0.0004	3166	48	655	13	169	3	163	8
EII-816-1-e-93	0.4657	0.0177	3.057	0.10520	0.0476	0.0010	0.0102	0.0007	4136	56	1422	26	300	6	205	13
EII-816-1-e-94	0.3372	0.0115	1.480	0.04533	0.0318	0.0006	0.0085	0.0005	3650	52	922	19	202	4	171	10
EII-816-1-e-108	0.5938	0.0299	7.320	0.33365	0.0895	0.0024	0.0458	0.0041	4493	72	2151	41	552	14	905	79
EII-816-1-f-120	0.2723	0.0111	0.993	0.03647	0.0265	0.0006	0.0077	0.0005	3319	63	701	19	168	4	154	11
EII-816-1-f-121	0.2926	0.0081	1.101	0.02749	0.0273	0.0004	0.0099	0.0004	3432	43	754	13	174	3	199	9
EII-816-1-f-131	0.2848	0.0131	1.138	0.04833	0.0290	0.0007	0.0074	0.0006	3390	71	772	23	184	4	148	12

A5.3. U-Pb isotope data of perovskites in the studied kimberlites

CALONDA	NORMAL CONCORDIA PLOT DATA				INVERSE CONCORDIA PLOT DATA			
Analysis No.	$^{207}Pb/^{235}U$	1s	$^{206}Pb/^{238}U$	1s	$^{238}U/^{206}Pb$	RSD	$^{207}Pb/^{206}Pb$	RSD
EII-816-1-a-5	0.7844	0.0101	0.0252	0.0002	39.619	1.287	0.225	1.287
EII-816-1-a-11	1.0915	0.0223	0.0299	0.0004	33.482	2.040	0.265	2.040
EII-816-1-a-15	2.0458	0.0261	0.0377	0.0004	26.529	1.277	0.393	1.277
EII-816-1-a-18	3.6988	0.0846	0.0514	0.0009	19.448	2.288	0.521	2.288
EII-816-1-a-18bo	2.6112	0.0350	0.0440	0.0004	22.734	1.339	0.430	1.339
EII-816-1-a-22	3.9121	0.0792	0.0568	0.0008	17.605	2.024	0.499	2.024
EII-816-1-a-30	3.8512	0.0487	0.0554	0.0004	18.060	1.264	0.504	1.264
EII-816-1-b-32	0.7413	0.0103	0.0250	0.0002	40.057	1.389	0.215	1.389
EII-816-1-b-33	1.3086	0.0256	0.0308	0.0004	32.502	1.957	0.308	1.957
EII-816-1-b-34	1.3816	0.0214	0.0325	0.0003	30.808	1.548	0.309	1.548
EII-816-1-c-40	0.9456	0.0193	0.0269	0.0003	37.190	2.042	0.255	2.042
EII-816-1-c-41	0.7956	0.0100	0.0257	0.0002	38.908	1.260	0.225	1.260
EII-816-1-c-43	0.7026	0.0108	0.0249	0.0002	40.133	1.544	0.204	1.544
EII-816-1-c-46	0.9874	0.0224	0.0288	0.0004	34.741	2.265	0.249	2.265
EII-816-1-c-47	2.5295	0.0596	0.0433	0.0006	23.084	2.356	0.423	2.356
EII-816-1-c-51	1.5708	0.0225	0.0321	0.0003	31.132	1.430	0.355	1.430
EII-816-1-c-53	1.1132	0.0181	0.0290	0.0003	34.461	1.625	0.278	1.625
EII-816-1-c-54	1.7130	0.0360	0.0340	0.0005	29.405	2.099	0.366	2.099
EII-816-1-d-68	0.9333	0.0125	0.0262	0.0002	38.216	1.342	0.259	1.342
EII-816-1-d-69	1.0851	0.0146	0.0280	0.0003	35.761	1.344	0.281	1.344
EII-816-1-d-73	1.7294	0.0349	0.0336	0.0004	29.773	2.019	0.374	2.019
EII-816-1-d-74	2.2995	0.0312	0.0436	0.0004	22.961	1.355	0.383	1.355
EII-816-1-d-76	1.6739	0.0294	0.0335	0.0004	29.884	1.754	0.363	1.754
EII-816-1-d-81	1.0593	0.0198	0.0278	0.0003	35.944	1.870	0.276	1.870
EII-816-1-d-85	0.9056	0.0126	0.0266	0.0002	37.606	1.387	0.247	1.387
EII-816-1-e-93	3.0575	0.0526	0.0476	0.0005	20.994	1.720	0.466	1.720
EII-816-1-e-94	1.4805	0.0227	0.0318	0.0003	31.398	1.531	0.337	1.531
EII-816-1-e-108	7.3197	0.1668	0.0895	0.0012	11.179	2.279	0.594	2.279
EII-816-1-f-120	0.9934	0.0182	0.0265	0.0003	37.789	1.836	0.272	1.836
EII-816-1-f-121	1.1005	0.0137	0.0273	0.0002	36.654	1.249	0.293	1.249
EII-816-1-f-131	1.1378	0.0242	0.0290	0.0003	34.508	2.124	0.285	2.124

A5.3. U-Pb isotope data of perovskites in the studied kimberlites

LUCAPA 1

RATIOS

Analysis No.	$^{207}Pb/^{206}Pb$	+/-2s	$^{207}Pb/^{235}U$	+/-2s	$^{206}Pb/^{238}U$	+/-2s	$^{208}Pb/^{232}Th$	+/-2s
H1-16a_1_01	0.2039	0.0141	0.701	0.04513	0.0249	0.0011	0.0069	0.0005
H1-16a_1_03	0.1859	0.0177	0.674	0.05881	0.0264	0.0014	0.0059	0.0005
H1-16a_3_14	0.2469	0.0166	0.891	0.05441	0.0262	0.0011	0.0087	0.0006
H1-16a_4_15	0.1927	0.0118	0.656	0.03780	0.0247	0.0010	0.0071	0.0005
H1-16a_4_16	0.2127	0.0296	0.752	0.09140	0.0256	0.0019	0.0076	0.0010
H1-16a_4_17	0.1848	0.0080	0.667	0.02781	0.0262	0.0008	0.0074	0.0004
H1-16a_5_22	0.1770	0.0076	0.627	0.02562	0.0257	0.0008	0.0072	0.0004
H1-16a_6_25	0.2099	0.0159	0.751	0.05148	0.0259	0.0011	0.0074	0.0007
H1-16a_6_27	0.2416	0.0136	0.872	0.04528	0.0262	0.0010	0.0088	0.0006
H1-16c_1_32	0.1769	0.0081	0.606	0.02632	0.0248	0.0008	0.0067	0.0004
H1-16c_1_34	0.2197	0.0244	0.761	0.07676	0.0251	0.0015	0.0059	0.0007
H1-16c_2_35	0.1710	0.0084	0.604	0.02831	0.0256	0.0008	0.0070	0.0004

AGES (Ma)

Analysis No.	$^{207}Pb/^{206}Pb$	+/-2s	$^{207}Pb/^{235}U$	+/-2s	$^{206}Pb/^{238}U$	+/-2s	$^{208}Pb/^{232}Th$	+/- 2 s
H1-16a_1_01	2857	111	539	27	159	7	139	10
H1-16a_1_03	2707	153	523	36	168	9	119	10
H1-16a_3_14	3165	105	647	29	167	7	175	13
H1-16a_4_15	2766	99	512	23	157	6	143	9
H1-16a_4_16	2926	216	569	53	163	12	153	20
H1-16a_4_17	2696	71	519	17	167	5	148	8
H1-16a_5_22	2625	70	494	16	164	5	144	7
H1-16a_6_25	2905	120	569	30	165	7	149	14
H1-16a_6_27	3131	88	637	25	167	6	178	12
H1-16c_1_32	2624	75	481	17	158	5	135	7
H1-16c_1_34	2978	174	574	44	160	10	119	14
H1-16c_2_35	2568	81	480	18	163	5	141	9

LUCAPA 1

NORMAL CONCORDIA PLOT DATA

Analysis No.	$^{207}Pb/^{235}U$	1s	$^{206}Pb/^{238}U$	1s
H1-16a_1_01	0.7009	0.0226	0.0249	0.0005
H1-16a_1_03	0.6739	0.0294	0.0264	0.0007
H1-16a_3_14	0.8906	0.0272	0.0262	0.0006
H1-16a_4_15	0.6562	0.0189	0.0247	0.0005
H1-16a_4_16	0.7518	0.0457	0.0256	0.0010
H1-16a_4_17	0.6674	0.0139	0.0262	0.0004
H1-16a_5_22	0.6269	0.0128	0.0257	0.0004
H1-16a_6_25	0.7510	0.0257	0.0259	0.0006
H1-16a_6_27	0.8723	0.0226	0.0262	0.0005
H1-16c_1_32	0.6061	0.0132	0.0248	0.0004
H1-16c_1_34	0.7605	0.0384	0.0251	0.0008
H1-16c_2_35	0.6037	0.0142	0.0256	0.0004

INVERSE CONCORDIA PLOT DATA

$^{238}U/^{206}Pb$	RSD	$^{207}Pb/^{206}Pb$	RSD
40.110	2.181	0.204	3.468
37.941	2.716	0.186	4.756
38.221	2.168	0.247	3.358
40.493	1.965	0.193	3.060
38.995	3.792	0.213	6.950
38.170	1.500	0.185	2.170
38.923	1.464	0.177	2.134
38.537	2.170	0.210	3.789
38.183	1.868	0.242	2.817
40.247	1.510	0.177	2.277
39.816	3.021	0.220	5.561
39.060	1.557	0.171	2.465

A5.3. U-Pb isotope data of perovskites in the studied kimberlites

LUCAPA 2

	RATIOS							
Analysis No.	$^{207}Pb/^{206}Pb$	+/-2s	$^{207}Pb/^{235}U$	+/-2s	$^{206}Pb/^{238}U$	+/-2s	$^{208}Pb/^{232}Th$	+/-2s
H2-8_01_38	0.2403	0.0144	1.005	0.05517	0.0303	0.0012	0.0097	0.0006
H2-8_01_39	0.2375	0.0203	0.942	0.07244	0.0288	0.0016	0.0084	0.0007
H2-8_02_41	0.2241	0.0101	1.005	0.04356	0.0325	0.0011	0.0101	0.0005
H2-8_02_42	0.2172	0.0161	0.929	0.06264	0.0310	0.0015	0.0114	0.0008
H2-8_03_43	0.2095	0.0150	0.700	0.04624	0.0243	0.0011	0.0068	0.0005
H2-8_04_44	0.2872	0.0402	1.666	0.19859	0.0422	0.0036	0.0220	0.0035
H2-8_04_45	0.2493	0.0116	1.247	0.05396	0.0363	0.0012	0.0113	0.0006
H2-8_05_47	0.2190	0.0122	0.977	0.05137	0.0323	0.0012	0.0082	0.0006
H2-8_05_48	0.2296	0.0343	0.983	0.12383	0.0312	0.0028	0.0515	0.0072
H2-8_06_49	0.2513	0.0172	1.413	0.08765	0.0408	0.0018	0.0122	0.0009
H2-8_06_50	0.2636	0.0123	1.216	0.05361	0.0335	0.0011	0.0091	0.0005
H2-8_06_51	0.2080	0.0100	0.765	0.03534	0.0267	0.0009	0.0069	0.0004
H2-8_06_52	0.2443	0.0202	0.989	0.07370	0.0294	0.0015	0.0120	0.0012
H2-8_06_53	0.1766	0.0101	0.579	0.03116	0.0238	0.0008	0.0064	0.0005

	AGES (Ma)							
Analysis No.	$^{207}Pb/^{206}Pb$	+/-2s	$^{207}Pb/^{235}U$	+/-2s	$^{206}Pb/^{238}U$	+/-2s	$^{208}Pb/^{232}Th$	+/- 2 s
H2-8_01_38	3122	94	706	28	193	8	196	11
H2-8_01_39	3104	133	674	38	183	10	169	14
H2-8_02_41	3011	72	706	22	206	7	203	10
H2-8_02_42	2960	117	667	33	197	9	229	17
H2-8_03_43	2902	113	539	28	155	7	138	11
H2-8_04_44	3403	210	996	76	267	22	440	69
H2-8_04_45	3181	73	822	24	230	8	227	11
H2-8_05_47	2973	89	692	26	205	8	166	11
H2-8_05_48	3049	230	695	63	198	18	1015	139
H2-8_06_49	3193	106	894	37	258	11	244	19
H2-8_06_50	3269	72	808	25	212	7	184	11
H2-8_06_51	2890	77	577	20	170	6	139	8
H2-8_06_52	3148	128	698	38	187	9	241	24
H2-8_06_53	2621	93	464	20	152	5	128	9

LUCAPA 2

	NORMAL CONCORDIA PLOT DATA			
Analysis No.	$^{207}Pb/^{235}U$	1s	$^{206}Pb/^{238}U$	1s
H2-8_01_38	1.0052	0.0276	0.0303	0.0006
H2-8_01_39	0.9419	0.0362	0.0288	0.0008
H2-8_02_41	1.0049	0.0218	0.0325	0.0005
H2-8_02_42	0.9286	0.0313	0.0310	0.0007
H2-8_03_43	0.6999	0.0231	0.0243	0.0006
H2-8_04_44	1.6659	0.0993	0.0422	0.0018
H2-8_04_45	1.2470	0.0270	0.0363	0.0006
H2-8_05_47	0.9766	0.0257	0.0323	0.0006
H2-8_05_48	0.9832	0.0619	0.0312	0.0014
H2-8_06_49	1.4131	0.0438	0.0408	0.0009
H2-8_06_50	1.2164	0.0268	0.0335	0.0005
H2-8_06_51	0.7648	0.0177	0.0267	0.0004
H2-8_06_52	0.9890	0.0368	0.0294	0.0007
H2-8_06_53	0.5786	0.0156	0.0238	0.0004

	INVERSE CONCORDIA PLOT DATA			
$^{238}U/^{206}Pb$	RSD	$^{207}Pb/^{206}Pb$	RSD
32.973	2.057	0.240	2.998
34.720	2.730	0.238	4.280
30.747	1.665	0.224	2.255
32.251	2.374	0.217	3.713
41.202	2.271	0.210	3.570
23.694	4.301	0.287	6.998
27.547	1.678	0.249	2.321
30.917	1.865	0.219	2.796
32.040	4.524	0.230	7.469
24.515	2.224	0.251	3.416
29.871	1.635	0.264	2.333
37.486	1.651	0.208	2.413
34.064	2.478	0.244	4.130
42.061	1.778	0.177	2.846

A5.4. Sr-Rb isotopic composition of the studied Angolan kimberlites obtained using LA-MC-ICP-MS.

$Sr_i = {}^{87}Sr/{}^{86}Sr_s - ({}^{87}Rb/{}^{86}Sr_s \times e^{\lambda t}-1)$

where s=sample; λ=0.01420/Ga; t=age (in Ga) calculated for each kimberlite in this study

Mulepe 1

Sample	Exp factor	1σ	$^{87}Sr/^{86}Sr_{\_corr}$	1σ	$^{86}Sr/^{88}Sr_{(m)}$	1σ	$^{84}Sr/^{86}Sr_{\_corr}$	1σ	Rb^{85} (V)	1σ
704-2-3-35	-1.5710	0.0620	0.70222	0.00230	0.11517	0.00016	0.05754	0.00160	0.00E+00	0.00E+00
704-2-3-36B	-1.7863	0.1600	0.70223	0.00200	0.11461	0.00043	0.05779	0.00250	2.68E-05	6.30E-06
704-2-A-2	-1.7922	0.1100	0.70318	0.00099	0.11459	0.00028	0.05440	0.00140	1.06E-05	5.60E-06
704-2-1-10	-1.8361	0.0510	0.70392	0.00081	0.11447	0.00013	0.05606	0.00086	1.31E-05	5.50E-06
704-2-3-34	-1.7230	0.0400	0.70325	0.00047	0.11477	0.00010	0.05629	0.00058	7.27E-06	6.10E-06
704-2-3-36	-1.8419	0.0720	0.70314	0.00110	0.11446	0.00019	0.05680	0.00150	1.22E-05	7.80E-06
704-2-A-60-2	-1.6464	0.0740	0.70285	0.00190	0.11497	0.00020	0.05363	0.00230	3.46E-06	1.40E-05
704-2-B-79	-1.8085	0.0510	0.70336	0.00097	0.11454	0.00013	0.05550	0.00140	1.52E-05	7.10E-06
704-2-D-90	-1.7204	0.0780	0.70269	0.00070	0.11466	0.00018	0.05763	0.00120	4.20E-05	1.30E-05
704-2-D-92	-1.6476	0.0520	0.70432	0.00098	0.11497	0.00014	0.05488	0.00130	6.37E-06	8.60E-06
708-2-2-11	-1.4629	0.1500	0.70327	0.00190	0.11546	0.00041	0.05074	0.00360	1.24E-06	1.10E-05
708-2-3-18	-1.5887	0.0930	0.70401	0.00130	0.11512	0.00025	0.05888	0.00130	0.00E+00	0.00E+00
708-2-3-20	-1.8840	0.1200	0.70416	0.00160	0.11435	0.00031	0.05830	0.00130	8.94E-06	6.10E-06
707-1-B-17a	-1.7216	0.0970	0.70420	0.00200	0.11477	0.00026	0.05218	0.00190	0.00E+00	0.00E+00
707-1-B-17	-1.7982	0.1000	0.70359	0.00180	0.11457	0.00027	0.05167	0.00180	3.39E-08	5.80E-06
707-1-E-32	-1.6178	0.0480	0.70349	0.00091	0.11505	0.00013	0.05409	0.00072	0.00E+00	0.00E+00
704-2-5-50	-1.8282	0.0940	0.70473	0.00180	0.11449	0.00025	0.05423	0.00160	2.05E-06	1.30E-05
704-2-1-2	-1.8333	0.0470	0.70481	0.00062	0.11448	0.00012	0.05382	0.00100	1.02E-05	5.10E-06
704-2-1-7	-1.7918	0.0500	0.70478	0.00140	0.11459	0.00013	0.05356	0.00310	8.80E-06	1.00E-05
704-2-2-22	-1.8347	0.0540	0.70348	0.00070	0.11447	0.00014	0.05387	0.00096	0.00E+00	0.00E+00

A5.4. Sr-Rb isotopic composition of the studied Angolan kimberlites obtained using LA-MC-ICP-MS.

Mulepe 1

Sample	$^{87}Sr/^{86}Sr\_Rb_{corr}$	1σ	$^{87}Rb/^{86}Sr_{\_Rb\ corr}$	1σ	Sr intensity	1σ	Kr^{83} Intensity	1σ	Sr_i
704-2-3-35	0.70234	0.00350	0.00000	0.00000	0.07649	0.00110	-1.70E-05	1.60E-05	0.70222
704-2-3-36B	0.70254	0.00270	0.00241	0.00057	0.04956	0.00070	5.07E-06	8.60E-06	0.70222
704-2-A-2	0.70427	0.00160	0.00053	0.00029	0.08315	0.00130	5.23E-06	5.80E-06	0.70318
704-2-1-10	0.70369	0.00120	0.00076	0.00031	0.07538	0.00160	7.68E-06	4.80E-06	0.70391
704-2-3-34	0.70247	0.00066	0.00017	0.00015	0.16534	0.00290	5.24E-06	5.30E-06	0.70325
704-2-3-36	0.69980	0.00120	0.00061	0.00039	0.08589	0.00140	-8.76E-06	6.70E-06	0.70314
704-2-A-60-2	0.70336	0.00180	0.00018	0.00065	0.09045	0.00069	3.28E-06	8.30E-06	0.70285
704-2-B-79	0.70187	0.00120	0.00111	0.00042	0.07859	0.00200	1.50E-05	5.10E-06	0.70335
704-2-D-90	0.70012	0.00170	0.00202	0.00064	0.09076	0.00082	1.02E-05	8.20E-06	0.70268
704-2-D-92	0.70317	0.00150	0.00056	0.00047	0.08224	0.00110	2.37E-05	8.60E-06	0.70432
708-2-2-11	0.71405	0.00400	0.00012	0.00084	0.05238	0.00081	1.38E-05	1.30E-05	0.70327
708-2-3-18	0.70856	0.00150	0.00000	0.00000	0.08447	0.00190	7.26E-06	6.80E-06	0.70401
708-2-3-20	0.70310	0.00220	0.00098	0.00050	0.04984	0.00071	3.15E-06	4.80E-06	0.70416
707-1-B-17a	0.70446	0.00270	0.00000	0.00000	0.06708	0.00220	1.73E-06	1.30E-05	0.70420
707-1-B-17	0.70205	0.00290	0.00008	0.00040	0.06593	0.00210	9.25E-06	1.00E-05	0.70359
707-1-E-32	0.70200	0.00150	0.00000	0.00000	0.06581	0.00180	1.21E-05	3.10E-06	0.70349
704-2-5-50	0.70242	0.00360	0.00014	0.00068	0.08125	0.00120	3.20E-05	1.10E-05	0.70473
704-2-1-2	0.70347	0.00100	0.00069	0.00032	0.07006	0.00180	8.39E-06	3.50E-06	0.70481
704-2-1-7	0.70045	0.00150	0.00046	0.00051	0.08746	0.00130	1.42E-05	1.60E-05	0.70478
704-2-2-22	0.70228	0.00094	0.00000	0.00000	0.07882	0.00190	1.84E-05	4.40E-06	0.70348

A5.4. Sr-Rb isotopic composition of the studied Angolan kimberlites obtained using LA-MC-ICP-MS.

Mulepe 2

Sample	Exp factor	1σ	$^{87}Sr/^{86}Sr_{\_corr}$	1σ	$^{86}Sr/^{88}Sr_{(m)}$	1σ	$^{84}Sr/^{86}Sr_{\_corr}$	1σ	Rb^{85} (V)	1σ
7231-1-1-01	-1.8304	0.0880	0.70404	0.00140	0.11449	0.00023	0.05486	0.00110	4.27E-06	5.60E-06
723-1-e1-17	-1.8628	0.0400	0.70404	0.00063	0.11440	0.00010	0.05550	0.00080	9.93E-06	8.20E-06
723-1-3-16	-1.9299	0.0820	0.70387	0.00120	0.11423	0.00021	0.05446	0.00180	2.74E-05	8.60E-06
723-1-d1-13	-1.8714	0.0790	0.70447	0.00140	0.11438	0.00021	0.05541	0.00190	8.99E-06	7.50E-06
728-1-E-29	-1.8375	0.0110	0.70241	0.00023	0.11447	0.00003	0.05644	0.00022	0.00E+00	0.00E+00
723-1-2-8	-1.8411	0.0700	0.70397	0.00160	0.11446	0.00018	0.05609	0.00150	0.00E+00	0.00E+00
723-1-2-10	-2.0066	0.3500	0.70218	0.00630	0.11406	0.00090	0.06210	0.01000	0.00E+00	0.00E+00
728-1-C-13	-2.0551	0.1700	0.70340	0.00380	0.11390	0.00045	0.04756	0.00470	0.00E+00	0.00E+00
728-1-E-34	-1.7396	0.2400	0.70282	0.00500	0.11473	0.00063	0.05311	0.00510	1.43E-05	1.70E-05
728-1-G-48	-2.1242	0.1400	0.70404	0.00300	0.11372	0.00036	0.04795	0.00370	2.25E-05	1.20E-05
728-3-7-55	-1.6497	0.0510	0.70202	0.00071	0.11496	0.00013	0.05559	0.00085	8.37E-07	7.40E-06
720-2-a-17	-1.7478	0.0790	0.70245	0.00120	0.11470	0.00021	0.03661	0.00190	6.18E-06	3.80E-06
720-2-c-10	-1.6150	0.0570	0.70306	0.00120	0.11505	0.00015	0.05926	0.00180	2.12E-05	1.70E-05
728-3-2-11	-1.5362	0.1100	0.70305	0.00140	0.11527	0.00030	0.05966	0.00220	3.58E-05	6.90E-06
728-3-3-19	-1.6036	0.0980	0.70307	0.00120	0.11509	0.00026	0.05709	0.00150	0.00E+00	0.00E+00
728-3-6-46	-1.7061	0.0840	0.70378	0.00094	0.11482	0.00022	0.05420	0.00170	1.45E-06	5.30E-06
728-3-B-10	-1.5561	0.0550	0.70322	0.00100	0.11521	0.00015	0.05605	0.00130	0.00E+00	0.00E+00
728-4-g-38	-1.4928	0.0900	0.70369	0.00100	0.11538	0.00024	0.05430	0.00170	6.26E-06	7.80E-06
728-3-3-20	-1.6627	0.1400	0.70215	0.00180	0.11493	0.00036	0.05736	0.00320	0.00E+00	0.00E+00
728-3-7-56	-1.6084	0.0570	0.70437	0.00120	0.11507	0.00015	0.05685	0.00130	1.83E-05	5.00E-06
728-3-7-56	-1.6405	0.0640	0.70267	0.00099	0.11499	0.00017	0.05622	0.00140	1.17E-05	4.50E-06
728-3-7-58	-1.8267	0.1900	0.70352	0.00190	0.11450	0.00050	0.05696	0.00300	2.17E-05	8.20E-06
728-1-B-12	-1.8913	0.1200	0.70118	0.00190	0.11433	0.00032	0.05253	0.00300	0.00E+00	0.00E+00
728-1-F-40	-1.8628	0.1000	0.70178	0.00240	0.11440	0.00026	0.05580	0.00160	2.27E-07	6.20E-06
728-1-G-56	-1.6217	0.0640	0.70568	0.00210	0.11497	0.00016	0.05580	0.00120	4.09E-05	2.10E-05
728-1-F-37	-1.9545	0.0780	0.70469	0.00110	0.11416	0.00020	0.05697	0.00250	0.00E+00	0.00E+00
728-1-G-51B	-1.6836	0.1200	0.70478	0.00230	0.11488	0.00030	0.05436	0.00220	0.00E+00	0.00E+00
728-1-G-51B	-1.6836	0.1200	0.70478	0.00230	0.11488	0.00030	0.05436	0.00220	0.00E+00	0.00E+00
720-2-c-12	-1.7333	0.1000	0.70531	0.00140	0.11474	0.00026	0.05456	0.00250	0.00E+00	0.00E+00
728-3-8-64	-1.8317	0.0490	0.70464	0.00092	0.11448	0.00013	0.05832	0.00150	6.60E-06	8.70E-06
728-4-a-6b	-1.6988	0.1200	0.70483	0.00270	0.11483	0.00031	0.04306	0.00260	3.84E-05	2.50E-05
728-3-4-31	-1.2998	0.1200	0.70453	0.00210	0.11589	0.00032	0.05402	0.00230	0.00E+00	0.00E+00
728-3-5-33	-1.7454	0.0810	0.70459	0.00190	0.11471	0.00021	0.05650	0.00280	1.83E-05	6.30E-06
728-3-5-33BO	-1.6055	0.0940	0.70530	0.00160	0.11508	0.00025	0.05517	0.00160	1.24E-05	6.90E-06
728-3-5-44	-1.6352	0.0850	0.70519	0.00100	0.11500	0.00023	0.05538	0.00100	1.13E-05	7.40E-06

A5.4. Sr-Rb isotopic composition of the studied Angolan kimberlites obtained using LA-MC-ICP-MS.

Mulepe 2

Sample	$^{87}Sr/^{86}Sr\_Rb_{corr}$	1σ	$^{87}Rb/^{86}Sr_{\_Rb\ corr}$	1σ	Sr intensity	1σ	Kr^{83} Intensity	1σ	Sr_i
7231-1-1-01	0.70311	0.00200	0.00042	0.00041	0.07330	0.00130	1.51E-05	7.10E-06	0.70404
723-1-e1-17	0.70370	0.00120	0.00052	0.00040	0.09218	0.00190	1.13E-05	5.80E-06	0.70404
723-1-3-16	0.70291	0.00220	0.00282	0.00090	0.05294	0.00190	7.13E-06	4.40E-06	0.70387
723-1-d1-13	0.70303	0.00210	0.00091	0.00054	0.05983	0.00220	1.26E-06	8.00E-06	0.70446
728-1-E-29	0.70270	0.00030	0.00000	0.00000	0.18758	0.00510	1.38E-05	2.40E-06	0.70241
723-1-2-8	0.70763	0.00170	0.00000	0.00000	0.05108	0.00093	6.61E-06	6.10E-06	0.70397
723-1-2-10	0.70604	0.01300	0.00000	0.00000	0.01587	0.00023	-1.72E-05	1.20E-05	0.70218
728-1-C-13	0.70263	0.00500	0.00000	0.00000	0.03613	0.00032	2.17E-05	4.80E-06	0.70340
728-1-E-34	0.70218	0.00650	0.00139	0.00180	0.04066	0.00120	2.43E-07	1.20E-05	0.70282
728-1-G-48	0.69330	0.00390	0.00234	0.00120	0.04330	0.00067	-1.98E-05	8.10E-06	0.70404
728-3-7-55	0.70188	0.00067	0.00001	0.00026	0.12540	0.00110	8.49E-06	6.00E-06	0.70202
720-2-a-17	0.70364	0.00200	0.00041	0.00026	0.06559	0.00061	2.48E-06	9.50E-06	0.70245
720-2-c-10	0.70230	0.00180	0.00127	0.00100	0.07248	0.00150	8.30E-06	5.70E-06	0.70305
728-3-2-11	0.69865	0.00150	0.00279	0.00057	0.05534	0.00230	5.94E-06	7.40E-06	0.70304
728-3-3-19	0.70438	0.00190	0.00000	0.00000	0.06733	0.00089	6.28E-06	5.60E-06	0.70307
728-3-6-46	0.70255	0.00170	0.00009	0.00036	0.06461	0.00055	6.77E-06	8.00E-06	0.70378
728-3-B-10	0.70350	0.00140	0.00000	0.00000	0.05889	0.00120	1.71E-06	6.60E-06	0.70322
728-4-g-38	0.70227	0.00190	0.00025	0.00058	0.04889	0.00130	8.84E-06	6.30E-06	0.70369
728-3-3-20	0.70262	0.00200	0.00000	0.00000	0.04331	0.00062	2.66E-05	9.50E-06	0.70215
728-3-7-56	0.70521	0.00160	0.00140	0.00038	0.05829	0.00180	8.55E-07	5.20E-06	0.70436
728-3-7-56	0.70419	0.00120	0.00081	0.00033	0.06117	0.00150	3.06E-07	4.30E-06	0.70267
728-3-7-58	0.69509	0.00250	0.00140	0.00052	0.06851	0.00120	6.32E-06	1.90E-05	0.70352
728-1-B-12	0.70111	0.00400	0.00000	0.00000	0.04626	0.00100	1.42E-05	8.30E-06	0.70118
728-1-F-40	0.70306	0.00250	0.00006	0.00056	0.04989	0.00140	-9.05E-06	9.20E-06	0.70178
728-1-G-56	0.70626	0.00140	0.00282	0.00140	0.05779	0.00086	6.28E-06	4.80E-06	0.70567
728-1-F-37	0.70335	0.00160	0.00000	0.00000	0.05829	0.00120	9.42E-06	7.70E-06	0.70469
728-1-G-51B	0.70489	0.00280	0.00000	0.00000	0.04589	0.00061	-5.75E-08	6.50E-06	0.70478
728-1-G-51B	0.70489	0.00280	0.00000	0.00000	0.04589	0.00061	-5.75E-08	6.50E-06	0.70478
720-2-c-12	0.70327	0.00120	0.00000	0.00000	0.07495	0.00160	7.98E-06	1.30E-05	0.70531
728-3-8-64	0.70036	0.00200	0.00058	0.00066	0.05786	0.00130	8.26E-06	6.80E-06	0.70464
728-4-a-6b	0.70546	0.00190	0.00281	0.00210	0.06592	0.01100	-1.55E-05	1.70E-05	0.70483
728-3-4-31	0.70765	0.00200	0.00000	0.00000	0.04445	0.00049	1.79E-05	7.40E-06	0.70453
728-3-5-33	0.69674	0.00250	0.00117	0.00041	0.05813	0.00230	6.60E-06	9.30E-06	0.70458
728-3-5-33BO	0.70171	0.00160	0.00136	0.00076	0.03986	0.00056	-5.46E-06	5.60E-06	0.70530
728-3-5-44	0.70128	0.00150	0.00075	0.00046	0.06785	0.00047	1.06E-05	6.60E-06	0.70519

A5.4. Sr-Rb isotopic composition of the studied Angolan kimberlites obtained using LA-MC-ICP-MS.

Lucapa 1

Sample	Exp factor	1σ	$^{87}Sr/^{86}Sr_{\_corr}$	1σ	$^{86}Sr/^{88}Sr_{(m)}$	1σ	$^{84}Sr/^{86}Sr_{\_corr}$	1σ	Rb^{85} (V)	1σ
H1-16A-3-18	-1.9670	0.0900	0.70392	0.00190	0.11413	0.00024	0.05746	0.00260	2.11E-05	8.60E-06
H1-16A-6-24	-1.9954	0.0360	0.70335	0.00073	0.11405	0.00010	0.05401	0.00094	0.00E+00	0.00E+00
h1-16A-1-6	-1.9611	0.0840	0.70422	0.00170	0.11414	0.00022	0.05600	0.00230	0.00E+00	0.00E+00
h1-16A-6-26	-2.2669	0.1200	0.70291	0.00160	0.11335	0.00031	0.05482	0.00310	0.00E+00	0.00E+00
h1-16A-1-X	-1.7332	0.0790	0.70195	0.00170	0.11474	0.00021	0.05250	0.00200	1.15E-06	5.70E-06
h1-16A-2-Z	-2.0627	0.0900	0.70429	0.00110	0.11388	0.00023	0.05558	0.00160	1.43E-05	7.00E-06
H1-16A-1-2	-1.6341	0.0880	0.70362	0.00120	0.11501	0.00023	0.05313	0.00089	4.34E-06	6.00E-06
H1-16A-1-2	-1.6453	0.0580	0.70206	0.00100	0.11497	0.00015	0.05295	0.00130	0.00E+00	0.00E+00
H1-16A-2-9	-1.8439	0.0840	0.70443	0.00130	0.11445	0.00022	0.05135	0.00180	1.00E-05	6.90E-06
H1-16A-3-16	-1.9119	0.1000	0.70456	0.00200	0.11428	0.00026	0.05033	0.00180	0.00E+00	0.00E+00
H1-16C-5-21	-1.7675	0.0710	0.70399	0.00098	0.11465	0.00019	0.05486	0.00130	0.00E+00	0.00E+00
h1-16A-1-Y	-1.7520	0.0650	0.70150	0.00094	0.11469	0.00017	0.05136	0.00170	2.60E-06	4.30E-06

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Sample	Exp factor	1σ	$^{87}Sr/^{86}Sr_{\_corr}$	1σ	$^{86}Sr/^{88}Sr_{(m)}$	1σ	$^{84}Sr/^{86}Sr_{\_corr}$	1σ	Rb^{85} (V)	1σ
MGR-13C-X-1	-1.6205	0.0570	0.70239	0.00120	0.11504	0.00015	0.05086	0.00140	1.87E-05	1.50E-05
MGR-13C-X-5	-1.9514	0.0530	0.70337	0.00084	0.11417	0.00014	0.05746	0.00091	7.68E-06	4.20E-06
MGR-34-B-131	-1.7600	0.0670	0.70346	0.00084	0.11467	0.00018	0.05391	0.00110	0.00E+00	0.00E+00
MGR-31-4-12	-1.4738	0.1200	0.70371	0.00180	0.11543	0.00031	0.05246	0.00280	1.97E-05	1.00E-05
MGR-13C-X-3	-1.7512	0.1700	0.70517	0.00230	0.11470	0.00045	0.05615	0.00300	1.43E-05	1.50E-05
MGR-13C-X-4	-1.8474	0.0880	0.70523	0.00110	0.11444	0.00023	0.05596	0.00210	1.50E-05	8.60E-06
MGR-13C-X-4	-1.7323	0.0840	0.70505	0.00120	0.11475	0.00022	0.05381	0.00160	2.98E-05	9.40E-06
MGR-13C-X6	-1.9757	0.1300	0.70458	0.00160	0.11411	0.00035	0.04603	0.00170	0.00E+00	0.00E+00
MGR-15c-d-85	-1.5418	0.0610	0.70500	0.00099	0.11525	0.00016	0.05527	0.00120	2.17E-05	6.10E-06

A5.4. Sr-Rb isotopic composition of the studied Angolan kimberlites obtained using LA-MC-ICP-MS.

Lucapa 1

Sample	$^{87}Sr/^{86}Sr\_Rb_{corr}$	1σ	$^{87}Rb/^{86}Sr_{\_Rb\ corr}$	1σ	Sr intensity	1σ	Kr^{83} Intensity	1σ	Sr_i
H1-16A-3-18	0.70366	0.00200	0.00159	0.00063	0.05641	0.00120	7.77E-06	8.30E-06	0.70391
H1-16A-6-24	0.70304	0.00100	0.00000	0.00000	0.07890	0.00190	-4.17E-06	4.50E-06	0.70335
h1-16A-1-6	0.70258	0.00190	0.00000	0.00000	0.04727	0.00086	-9.28E-07	8.40E-06	0.70422
h1-16A-6-26	0.70305	0.00320	0.00000	0.00000	0.05237	0.00098	6.07E-06	9.00E-06	0.70291
h1-16A-1-X	0.70301	0.00220	0.00021	0.00057	0.04243	0.00077	-2.12E-06	8.00E-06	0.70195
h1-16A-2-Z	0.70348	0.00220	0.00103	0.00048	0.06429	0.00180	2.80E-06	8.20E-06	0.70429
H1-16A-1-2	0.70571	0.00160	0.00033	0.00048	0.05451	0.00083	8.77E-06	4.90E-06	0.70362
H1-16A-1-2	0.70394	0.00150	0.00000	0.00000	0.05477	0.00084	1.49E-05	5.70E-06	0.70206
H1-16A-2-9	0.70212	0.00190	0.00037	0.00049	0.05800	0.00220	1.77E-05	4.80E-06	0.70443
H1-16A-3-16	0.70217	0.00320	0.00000	0.00000	0.03763	0.00100	9.74E-06	7.00E-06	0.70456
H1-16C-5-21	0.70221	0.00150	0.00000	0.00000	0.04570	0.00072	1.92E-06	5.50E-06	0.70399
h1-16A-1-Y	0.70668	0.00160	0.00025	0.00038	0.04938	0.00055	6.77E-06	6.10E-06	0.70150

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Sample	$^{87}Sr/^{86}Sr\_Rb_{corr}$	1σ	$^{87}Rb/^{86}Sr_{\_Rb\ corr}$	1σ	Sr intensity	1σ	Kr^{83} Intensity	1σ	Sr_i
MGR-13C-X-1	0.70397	0.00180	0.00102	0.00080	0.08529	0.00120	5.17E-06	1.10E-05	0.70238
MGR-13C-X-5	0.70106	0.00130	0.00043	0.00028	0.06126	0.00170	1.60E-05	3.80E-06	0.70337
MGR-34-B-131	0.70411	0.00098	0.00000	0.00000	0.07368	0.00088	1.83E-05	4.50E-06	0.70346
MGR-31-4-12	0.70478	0.00240	0.00184	0.00096	0.04519	0.00039	9.36E-07	1.00E-05	0.70371
MGR-13C-X-3	0.70480	0.00350	0.00162	0.00150	0.04614	0.00100	1.36E-05	1.10E-05	0.70517
MGR-13C-X-4	0.70004	0.00230	0.00105	0.00057	0.06896	0.00180	1.06E-05	6.80E-06	0.70523
MGR-13C-X-4	0.70097	0.00140	0.00239	0.00076	0.06385	0.00250	1.06E-05	6.60E-06	0.70505
MGR-13C-X6	0.70286	0.00280	0.00000	0.00000	0.04699	0.00060	7.73E-06	6.10E-06	0.70458
MGR-15c-d-85	0.70168	0.00097	0.00162	0.00044	0.06057	0.00160	2.20E-05	4.90E-06	0.70500

A5.4. Sm-Nd isotopic composition of the studied Angolan kimberlites obtained using LA-MC-ICP-MS.

$\varepsilon_{Nd}(t) = ((^{143}Nd/^{144}Nd)_s - (^{147}Sm/^{144}Nd)_s \times (e^{\lambda t} - 1)) / ((^{143}Nd/^{144}Nd)_{CHUR} - (^{147}Sm/^{144}Nd)_{CHUR} \times (e^{\lambda t} - 1)) - 1) \times 10000$

where s=sample; $(^{143}Nd/^{144}Nd)_{CHUR} = 0.512638$; and $(^{147}Sm/^{144}Nd)_{CHUR} = 0.1967$; $\lambda = 0.00654$/Ga for ^{147}Sm; t=age (in Ga) calculated for each kimberlite in this study

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Sample	$^{142}Nd/^{144}Nd_{-Corr}$	1σ	$^{143}Nd/^{144}Nd_{Corr}$	1σ	$^{145}Nd/^{144}Nd_{Corr}$	1σ	$^{149}Nd/^{144}Nd_{Corr}$	1σ	$^{150}Nd/^{144}Nd_{Corr}$	1σ	Exp Factor	1σ	Total Nd
MGR-15C-e-89	2.42519	0.018	0.511641	0.00017	0.348899	0.00019	0.242299	0.00033	0.236774	0.0005	-2.0618	0.037	0.362421
MGR-15C-c-80	2.42959	0.0041	0.511772	0.0003	0.348808	0.00023	0.242505	0.00033	0.237075	0.0011	-2.05695	0.05	0.347853
MGR-13B_a_x	2.30448	0.012	0.512493	0.0002	0.348668	0.00014	0.241481	0.00024	0.23594	0.00056	-2.20053	0.024	0.401337
mgr-34-b-128	2.29025	0.013	0.512506	0.000093	0.348373	0.000093	0.241647	0.00016	0.23576	0.0003	-2.1511	0.019	0.485375
MGR-31-3-7	2.36115	0.013	0.512516	0.00011	0.348616	0.00013	0.241799	0.00018	0.236324	0.00039	-2.09403	0.026	0.33272
mgr-34-f-144	2.3409	0.006	0.512557	0.00028	0.348529	0.0002	0.241422	0.00036	0.235613	0.0011	-2.08811	0.04	0.568771
MGR-13b-g-37	2.36235	0.0077	0.512643	0.00015	0.348708	0.00023	0.24209	0.00038	0.236191	0.00058	-2.10235	0.04	0.402628
MGR-31-4-11	2.29794	0.0056	0.512651	0.00014	0.348477	0.0001	0.241485	0.00019	0.236237	0.00046	-2.07656	0.023	0.514634
MGR-13B_a_8	2.34796	0.0084	0.51278	0.00025	0.34832	0.00019	0.241394	0.00036	0.235356	0.00085	-2.23028	0.034	0.5302
MGR-13c-x4	2.67605	0.018	0.512897	0.00053	0.348439	0.00051	0.240761	0.00074	0.235667	0.0016	-2.11414	0.12	0.256174
MGR-34_g_147	2.3987	0.006	0.512923	0.00014	0.348329	0.000065	0.241328	0.00011	0.235236	0.00043	-2.2488	0.017	0.885527
MGR-13c-x1	2.39301	0.011	0.512965	0.00034	0.348381	0.0002	0.241337	0.00047	0.235565	0.0017	-2.16747	0.052	0.551365
MGR-13c-x2	2.39204	0.0067	0.513015	0.000084	0.348341	0.00012	0.241464	0.00016	0.235372	0.00037	-2.19711	0.024	0.41918
mgr-31b-b-100	2.45032	0.018	0.513049	0.00025	0.348678	0.00027	0.241786	0.00048	0.235725	0.0011	-2.15571	0.057	0.317148

Mulepe 1

Sample	$^{142}Nd/^{144}Nd_{-Corr}$	1σ	$^{143}Nd/^{144}Nd_{Corr}$	1σ	$^{145}Nd/^{144}Nd_{Corr}$	1σ	$^{149}Nd/^{144}Nd_{Corr}$	1σ	$^{150}Nd/^{144}Nd_{Corr}$	1σ	Exp Factor	1σ	Total Nd
708-2-5-34	2.3222	0.0058	0.511695	0.00025	0.348876	0.00025	0.242046	0.00036	0.236591	0.0009	-2.2010	0.052	0.462306
708-2-4-23	2.4317	0.011	0.511799	0.00061	0.348562	0.00035	0.241197	0.00048	0.235512	0.0022	-2.2848	0.083	0.294848
708-2-3-19	2.3126	0.007	0.51191	0.00027	0.348837	0.00014	0.241996	0.00025	0.236725	0.00078	-2.2401	0.033	0.381361
704-2-1-6	2.3936	0.0057	0.511952	0.00024	0.348648	0.0002	0.242024	0.00033	0.236115	0.00066	-2.0835	0.046	0.306239
704-2-5-51	2.7534	0.0073	0.512029	0.00037	0.348592	0.00044	0.24116	0.00084	0.235918	0.0016	-2.0568	0.110	0.156285
704-2-1-11	2.5935	0.0093	0.512027	0.00029	0.348293	0.00037	0.241341	0.00058	0.235978	0.001	-2.1225	0.080	0.187764
704-2-C-89	2.6517	0.015	0.512134	0.00051	0.348656	0.00034	0.24172	0.00054	0.236681	0.0014	-2.0173	0.076	0.218614
704-2-1-8	2.5278	0.02	0.512464	0.00024	0.34837	0.00024	0.241469	0.00032	0.235655	0.00073	-2.0971	0.040	0.377955
707-1-d-27	2.2122	0.0038	0.512467	0.00015	0.348473	0.000084	0.241612	0.00013	0.236327	0.00028	-2.0772	0.020	0.531653
704-2-B-67	2.3467	0.012	0.512672	0.00020	0.348497	0.000093	0.241414	0.00018	0.23626	0.00045	-2.0888	0.026	0.430664
704-2-C-81	2.5703	0.012	0.512949	0.00100	0.34841	0.00069	0.240417	0.00072	0.235709	0.0033	-1.9751	0.150	0.2287
704-2-D-91	2.4230	0.021	0.513078	0.00026	0.348475	0.00018	0.241417	0.00035	0.234793	0.00085	-2.0941	0.038	0.36687
704-2-3-30	2.4307	0.011	0.513202	0.00065	0.348112	0.0006	0.240821	0.001	0.234876	0.0018	-2.1700	0.140	0.223338
704-2-C-83	2.4149	0.0092	0.513199	0.00023	0.34824	0.00021	0.241409	0.00037	0.235232	0.0008	-2.09007	0.039	0.372408

A5.4. Sm-Nd isotopic composition of the studied Angolan kimberlites obtained using LA-MC-ICP-MS.

Cat115

Sample	1σ	^{147}Sm	1σ	^{147}Sm / ^{144}Nd	1σ	$(^{143}Nd/^{144}Nd)_T$	1σ	$\varepsilon Nd_{(0)}$	1σ	$\varepsilon Nd_{(T)}$	1σ
MGR-15C-e-89	0.03	0.00703945	0.00055	0.0812703	0.00062	0.51157	0.00017	-19.4	3.3	-17.5	3.3
MGR-15C-c-80	0.012	0.006689	0.00021	0.0799601	0.00023	0.51170	0.00030	-16.9	5.9	-14.9	5.9
MGR-13B_a_x	0.036	0.0076333	0.00069	0.0787378	0.00012	0.51242	0.00020	-2.8	3.9	-0.8	3.9
mgr-34-b-128	0.029	0.00925168	0.00052	0.0792481	0.00035	0.51244	0.00009	-2.6	1.8	-0.6	1.8
MGR-31-3-7	0.017	0.00635985	0.0003	0.0793239	0.00021	0.51245	0.00011	-2.4	2.1	-0.4	2.1
mgr-34-f-144	0.016	0.0108655	0.00028	0.0793854	0.00017	0.51249	0.00028	-1.6	5.5	0.4	5.5
MGR-13b-g-37	0.026	0.00794412	0.00046	0.0829014	0.0007	0.51257	0.00015	0.1	2.9	2.0	2.9
MGR-31-4-11	0.019	0.00965784	0.00035	0.0776789	0.00012	0.51258	0.00014	0.3	2.7	2.3	2.7
MGR-13B_a_8	0.019	0.0101587	0.00035	0.0793636	0.00017	0.51271	0.00025	2.8	4.9	4.8	4.9
MGR-13c-x4	0.021	0.00532077	0.00039	0.0865998	0.0011	0.51282	0.00053	5.1	10.3	6.9	10.3
MGR-34_g_147	0.049	0.0169454	0.00086	0.0798268	0.00046	0.51285	0.00014	5.6	2.7	7.5	2.7
MGR-13c-x1	0.0081	0.0106467	0.00016	0.0799141	0.000045	0.51290	0.00034	6.4	6.6	8.4	6.6
MGR-13c-x2	0.031	0.00817044	0.00056	0.0811612	0.00039	0.51294	0.00008	7.4	1.6	9.3	1.6
mgr-31b-b-100	0.025	0.00620742	0.00046	0.0815076	0.00047	0.51298	0.00025	8.0	4.9	10.0	4.9

Mulepe 1

Sample	1σ	^{147}Sm	1σ	^{147}Sm / ^{144}Nd	1σ	$(^{143}Nd/^{144}Nd)_T$	1σ	$\varepsilon Nd_{(0)}$	1σ	$\varepsilon Nd_{(T)}$	1σ
708-2-5-34	0.03	0.00903915	0.00057	0.0812	0.0003	0.51163	0.00025	-18.4	4.9	-16.7	4.9
708-2-4-23	0.021	0.00595567	0.00038	0.0845	0.0009	0.51173	0.00061	-16.4	11.9	-14.7	11.9
708-2-3-19	0.013	0.00747673	0.00023	0.0817	0.0004	0.51185	0.00027	-14.2	5.3	-12.5	5.3
704-2-1-6	0.02	0.00629342	0.00038	0.0862	0.0006	0.51189	0.00024	-13.4	4.7	-11.7	4.7
704-2-5-51	0.0051	0.00367012	0.00011	0.0974	0.0004	0.51195	0.00037	-11.9	7.2	-10.4	7.2
704-2-1-11	0.0084	0.00423293	0.00016	0.0939	0.0009	0.51196	0.00029	-11.9	5.7	-10.4	5.7
704-2-C-89	0.011	0.00435188	0.0002	0.0828	0.0008	0.51207	0.00051	-9.8	10.0	-8.1	10.0
704-2-1-8	0.03	0.00699407	0.00052	0.0775	0.0007	0.51241	0.00024	-3.4	4.7	-1.6	4.7
707-1-d-27	0.019	0.0101733	0.00036	0.0794	0.0001	0.51241	0.00015	-3.3	2.9	-1.6	2.9
704-2-B-67	0.026	0.00766336	0.00049	0.0753	0.0002	0.51261	0.00020	0.7	3.9	2.5	3.9
704-2-C-81	0.033	0.0042458	0.00059	0.0774	0.0008	0.51289	0.00100	6.1	19.5	7.8	19.5
704-2-D-91	0.032	0.00724004	0.00061	0.0828	0.0005	0.51302	0.00026	8.6	5.1	10.3	5.1
704-2-3-30	0.014	0.00454918	0.00028	0.0845	0.0002	0.51314	0.00065	11.0	12.7	12.7	12.7
704-2-C-83	0.027	0.00719965	0.0005	0.0803273	0.00038	0.51314	0.00023	10.9	4.5	12.7	4.5

A5.4. Sm-Nd isotopic composition of the studied Angolan kimberlites obtained using LA-MC-ICP-MS.

Mulepe 2

Sample	$^{142}Nd/^{144}Nd_{\_Corr}$	1σ	$^{143}Nd/^{144}Nd_{Corr}$	1σ	$^{145}Nd/^{144}Nd_{Corr}$	1σ	$^{149}Nd/^{144}Nd_{Corr}$	1σ	$^{150}Nd/^{144}Nd_{Corr}$	1σ	Exp Factor	1σ	Total Nd
728-3-a-1	2.26563	0.0088	0.512126	0.00028	0.348196	0.0004	0.241628	0.00048	0.236597	0.0011	-2.12339	0.068	0.293658
728-3-a-2	2.22139	0.011	0.512351	0.00018	0.348665	0.00018	0.241585	0.0004	0.23604	0.00052	-2.11861	0.039	0.272945
728-3-4-30	2.26511	0.0073	0.512372	0.00028	0.348685	0.00024	0.241563	0.0003	0.236534	0.00072	-1.94571	0.042	0.296788
728-3-b-8	2.17876	0.0085	0.512391	0.00016	0.348529	0.000098	0.241778	0.00017	0.237077	0.00046	-2.05676	0.022	0.328621
720-2-C-11	2.16741	0.0073	0.512443	0.00024	0.348643	0.00018	0.241551	0.00038	0.236335	0.00088	-2.0949	0.045	0.351725
728-3-4-25	2.27895	0.0087	0.512452	0.000075	0.348475	0.000062	0.241702	0.00009	0.236785	0.00021	-2.00558	0.015	0.681268
728-3-5-36	2.16894	0.0059	0.512488	0.00027	0.34894	0.00032	0.242656	0.0004	0.237097	0.00099	-1.8447	0.056	0.362636
728-3-8-63	2.32286	0.011	0.512508	0.00031	0.348368	0.00028	0.241343	0.00036	0.234982	0.00085	-2.04692	0.06	0.234407
723-1-2-11	2.58261	0.0084	0.512518	0.00031	0.348469	0.00022	0.241545	0.00044	0.235933	0.0011	-2.02385	0.053	0.39031
728-1-d-21	2.17814	0.01	0.512542	0.00019	0.348401	0.0002	0.241826	0.00033	0.236235	0.00054	-2.28068	0.038	0.313752
728-3-5-41	2.22533	0.0072	0.512572	0.00024	0.348412	0.00027	0.241568	0.0004	0.235877	0.00094	-1.99187	0.053	0.317015
728-3-5-41	2.22533	0.0072	0.512572	0.00024	0.348412	0.00027	0.241568	0.0004	0.235877	0.00094	-1.99187	0.053	0.317015
723-1-b-6	2.29305	0.0077	0.512579	0.00023	0.348747	0.00023	0.241938	0.00035	0.235913	0.00065	-2.20887	0.048	0.454753
728-3-2-14	2.15876	0.014	0.512628	0.00017	0.348758	0.00025	0.241994	0.00037	0.23702	0.00061	-1.9296	0.05	0.319222
728-1-G-52	2.21168	0.0068	0.512673	0.00029	0.34827	0.00033	0.241168	0.00056	0.235202	0.00089	-2.11837	0.07	0.161997
728-1-a-1	2.13757	0.0075	0.512688	0.00024	0.348355	0.00026	0.2417	0.00036	0.234779	0.0014	-2.35485	0.06	0.241237
728-3-5-43b	2.13914	0.0048	0.512703	0.00011	0.348365	0.00013	0.241154	0.0002	0.235379	0.00035	-2.16812	0.022	0.248439
728-1-b-11	2.23552	0.007	0.512709	0.00039	0.348636	0.00044	0.241003	0.00076	0.234725	0.0012	-2.28644	0.085	0.189305
728-3-1-1	2.24021	0.0062	0.512718	0.00026	0.348446	0.00023	0.241494	0.00032	0.235798	0.00052	-1.99671	0.049	0.2825
720-2-C-9	2.20413	0.01	0.512735	0.00023	0.348564	0.00022	0.241473	0.0004	0.235466	0.00083	-2.1815	0.054	0.279033
728-1-C-19.run	2.23377	0.0089	0.512753	0.00033	0.348575	0.0002	0.241373	0.00038	0.23592	0.00089	-2.12004	0.051	0.267424
720-2-E-21	2.31473	0.0039	0.512757	0.00028	0.348326	0.00019	0.241408	0.00031	0.234605	0.00059	-2.14862	0.042	0.280878
728-1-c-17	2.21665	0.0045	0.512769	0.00028	0.34862	0.00026	0.241636	0.00032	0.235198	0.0011	-2.22801	0.047	0.254992
728-3-1-8	2.24212	0.0059	0.51281	0.00013	0.348227	0.000099	0.24126	0.00017	0.235788	0.00027	-2.2301	0.023	0.583555
728-3-2-18	2.13669	0.0036	0.512854	0.00017	0.348153	0.00016	0.241182	0.00027	0.234996	0.00046	-2.21646	0.034	0.396137
728-3-d-25	2.25053	0.0061	0.512921	0.00026	0.348163	0.00025	0.240575	0.00041	0.23541	0.00071	-2.19506	0.05	0.292325
728-3-1-9	2.34188	0.024	0.512957	0.00044	0.348429	0.00028	0.242593	0.00057	0.236388	0.0011	-2.00657	0.073	0.238521
728-1-E-35.run	2.19877	0.0043	0.512973	0.00027	0.348439	0.00022	0.241417	0.00045	0.23548	0.00084	-2.1058	0.041	0.299824
728-3-6-47	2.24331	0.0063	0.512974	0.00028	0.348162	0.00022	0.241488	0.00035	0.234956	0.001	-1.98787	0.044	0.295585
728-3-7-57	2.25367	0.0081	0.512995	0.00025	0.348362	0.00031	0.241643	0.00054	0.235756	0.001	-1.99478	0.065	0.282914
728-4-h-41	2.30725	0.0049	0.513131	0.00019	0.348466	0.00026	0.242027	0.00053	0.235013	0.00079	-2.15739	0.056	0.247281
728-1-f-44	2.21875	0.0077	0.513139	0.00028	0.348325	0.00025	0.241454	0.00043	0.234239	0.0012	-2.32401	0.065	0.297326
728-1-D-23.run	2.29792	0.01	0.513257	0.00039	0.348068	0.0003	0.240484	0.00046	0.234623	0.0011	-2.19238	0.051	0.241055
728-4-f-35b	2.20277	0.006	0.51346	0.00042	0.348607	0.00041	0.240952	0.00056	0.234852	0.00097	-2.22464	0.081	0.16873

A5.4. Sm-Nd isotopic composition of the studied Angolan kimberlites obtained using LA-MC-ICP-MS.

Mulepe 2

Sample	1σ	^{147}Sm	1σ	^{147}Sm / ^{144}Nd	1σ	$(^{143}Nd/^{144}Nd)_T$	1σ	$\varepsilon Nd_{(0)}$	1σ	$\varepsilon Nd_{(T)}$	1σ
728-3-a-1	0.012	0.00630096	0.00024	0.0892592	0.00038	0.51205	0.00028	-10.0	5.5	-8.3	5.5
728-3-a-2	0.019	0.00574729	0.00038	0.0874121	0.00048	0.51228	0.00018	-5.6	3.5	-3.9	3.5
728-3-4-30	0.015	0.00625963	0.0003	0.087748	0.00034	0.51230	0.00028	-5.2	5.5	-3.5	5.5
728-3-b-8	0.0088	0.00688084	0.00019	0.0868087	0.000098	0.51232	0.00016	-4.8	3.1	-3.1	3.1
720-2-C-11	0.013	0.00709685	0.00027	0.0837841	0.00014	0.51238	0.00024	-3.8	4.7	-2.0	4.7
728-3-4-25	0.018	0.0142622	0.00037	0.0868293	0.000095	0.51238	0.00007	-3.6	1.5	-1.9	1.5
728-3-5-36	0.022	0.00743507	0.00045	0.0853213	0.00022	0.51242	0.00027	-2.9	5.3	-1.2	5.3
728-3-8-63	0.015	0.00486217	0.00029	0.0860411	0.00027	0.51244	0.00031	-2.5	6.0	-0.8	6.0
723-1-2-11	0.018	0.00840644	0.00038	0.0893101	0.00017	0.51245	0.00031	-2.3	6.0	-0.7	6.0
728-1-d-21	0.0061	0.00653024	0.00012	0.0861642	0.00017	0.51247	0.00019	-1.9	3.7	-0.1	3.7
728-3-5-41	0.019	0.00667505	0.00036	0.0879996	0.00052	0.51250	0.00024	-1.3	4.7	0.4	4.7
728-3-5-41	0.019	0.00667505	0.00036	0.0879996	0.00052	0.51250	0.00024	-1.3	4.7	0.4	4.7
723-1-b-6	0.025	0.00949782	0.00052	0.0866919	0.0002	0.51251	0.00023	-1.2	4.5	0.6	4.5
728-3-2-14	0.011	0.00667615	0.00021	0.0865428	0.00032	0.51256	0.00017	-0.2	3.3	1.5	3.3
728-1-G-52	0.0094	0.00336199	0.00019	0.0860882	0.00032	0.51260	0.00029	0.7	5.7	2.4	5.7
728-1-a-1	0.01	0.00502889	0.00021	0.086079	0.00011	0.51262	0.00024	1.0	4.7	2.7	4.7
728-3-5-43b	0.015	0.00517412	0.0003	0.0861983	0.0002	0.51263	0.00011	1.3	2.1	3.0	2.1
728-1-b-11	0.015	0.00401839	0.0003	0.0882377	0.00056	0.51264	0.00039	1.4	7.6	3.1	7.6
728-3-1-1	0.016	0.00591821	0.00033	0.0871979	0.00032	0.51265	0.00026	1.6	5.1	3.3	5.1
720-2-C-9	0.013	0.00572301	0.00027	0.0849657	0.00014	0.51267	0.00023	1.9	4.5	3.6	4.5
728-1-C-19.run	0.014	0.00568485	0.00028	0.0885396	0.0005	0.51268	0.00033	2.2	6.4	3.9	6.4
720-2-E-21	0.013	0.00593967	0.00025	0.0876024	0.00047	0.51269	0.00028	2.3	5.5	4.0	5.5
728-1-c-17	0.013	0.00545927	0.00026	0.0890443	0.00046	0.51270	0.00028	2.6	5.5	4.2	5.5
728-3-1-8	0.037	0.0118137	0.00077	0.0837235	0.00011	0.51274	0.00013	3.4	2.5	5.1	2.5
728-3-2-18	0.013	0.00817105	0.00027	0.0853259	0.00015	0.51279	0.00017	4.2	3.3	6.0	3.3
728-3-d-25	0.015	0.00619051	0.00029	0.0878235	0.00042	0.51285	0.00026	5.5	5.1	7.2	5.1
728-3-1-9	0.023	0.00510567	0.00046	0.0893369	0.00089	0.51289	0.00044	6.2	8.6	7.9	8.6
728-1-E-35.run	0.018	0.00625269	0.00036	0.0866915	0.00023	0.51290	0.00027	6.5	5.3	8.3	5.3
728-3-6-47	0.013	0.00622718	0.00027	0.087213	0.00016	0.51290	0.00028	6.6	5.5	8.3	5.5
728-3-7-57	0.017	0.00592442	0.00034	0.0870851	0.00029	0.51292	0.00025	7.0	4.9	8.7	4.9
728-4-h-41	0.016	0.00526948	0.00031	0.0889381	0.00038	0.51306	0.00019	9.6	3.7	11.3	3.7
728-1-f-44	0.015	0.00617779	0.00032	0.085953	0.00013	0.51307	0.00028	9.8	5.5	11.5	5.5
728-1-D-23.run	0.015	0.00517361	0.0003	0.0887749	0.00049	0.51319	0.00039	12.1	7.6	13.8	7.6
728-4-f-35b	0.0063	0.00357858	0.00013	0.0878523	0.00029	0.51339	0.00042	16.0	8.2	17.7	8.2

A5.4. Sm-Nd isotopic composition of the studied Angolan kimberlites obtained using LA-MC-ICP-MS.

Lucapa 1

Sample	$^{142}Nd/^{144}Nd_{\_Corr}$	1σ	$^{143}Nd/^{144}Nd_{Corr}$	1σ	$^{145}Nd/^{144}Nd_{Corr}$	1σ	$^{149}Nd/^{144}Nd_{Corr}$	1σ	$^{150}Nd/^{144}Nd_{Corr}$	1σ	Exp Factor	1σ	Total Nd
H1-16A-2-13	2.17235	0.0065	0.512321	0.00015	0.348553	0.00018	0.24163	0.00027	0.236687	0.00062	-1.95327	0.037	0.344812
H1-16a-1-8	2.42843	0.0075	0.512563	0.00015	0.348728	0.00018	0.2421	0.00028	0.236118	0.00069	-2.17479	0.037	0.443006
H1-16A-3-15	2.28654	0.009	0.512584	0.00029	0.348368	0.00025	0.241387	0.00044	0.235551	0.0011	-1.97823	0.056	0.296862
H1-16c-4-17	2.28156	0.01	0.51264	0.00011	0.348482	0.00013	0.24168	0.00018	0.236235	0.0004	-2.3136	0.029	0.5329
H1-16A-2-11	2.32899	0.01	0.512646	0.00077	0.348741	0.00038	0.241917	0.00075	0.236364	0.0024	-1.91754	0.093	0.257035
H1-16A-1-3	2.43725	0.0078	0.512746	0.001	0.348178	0.00064	0.240316	0.0012	0.235817	0.0042	-2.14534	0.18	0.241483
H1-16A-7-29	2.27318	0.0085	0.512775	0.00042	0.348417	0.00029	0.241201	0.00053	0.235312	0.0014	-1.98611	0.06	0.322296
H1-16C-3-9	2.26169	0.0054	0.513107	0.00019	0.348385	0.00019	0.241536	0.0003	0.23533	0.00072	-2.01873	0.038	0.253709
H1-16A-3-17	2.20764	0.0065	0.513175	0.00017	0.348194	0.00017	0.241376	0.00031	0.235283	0.00072	-2.07849	0.039	0.31096

A5.4. Sm-Nd isotopic composition of the studied Angolan kimberlites obtained using LA-MC-ICP-MS.

Lucapa 1

Sample	1σ	^{147}Sm	1σ	^{147}Sm / ^{144}Nd	1σ	$(^{143}Nd/^{144}Nd)_T$	1σ	$\varepsilon Nd_{(0)}$	1σ	$\varepsilon Nd_{(T)}$	1σ
H1-16A-2-13	0.02	0.00699822	0.00039	0.0845304	0.00031	0.51225	0.00015	-6.2	2.9	-4.2	2.9
H1-16a-1-8	0.031	0.009031	0.0006	0.0850929	0.00055	0.51249	0.00015	-1.5	2.9	0.5	2.9
H1-16A-3-15	0.017	0.00606447	0.00034	0.0847031	0.00021	0.51251	0.00029	-1.1	5.7	0.9	5.7
H1-16c-4-17	0.013	0.010661	0.00025	0.0828083	0.000061	0.51257	0.00011	0.0	2.1	2.0	2.1
H1-16A-2-11	0.024	0.00521126	0.00048	0.0841005	0.00027	0.51257	0.00077	0.2	15.0	2.1	15.0
H1-16A-1-3	0.0078	0.00513099	0.00017	0.0879582	0.00062	0.51267	0.00100	2.1	19.5	4.0	19.5
H1-16A-7-29	0.011	0.00651427	0.00023	0.0838255	0.00012	0.51270	0.00042	2.7	8.2	4.6	8.2
H1-16C-3-9	0.011	0.0053299	0.00021	0.0856744	0.00026	0.51303	0.00019	9.1	3.7	11.1	3.7
H1-16A-3-17	0.018	0.00629935	0.00035	0.0843526	0.00029	0.51310	0.00017	10.5	3.3	12.4	3.3

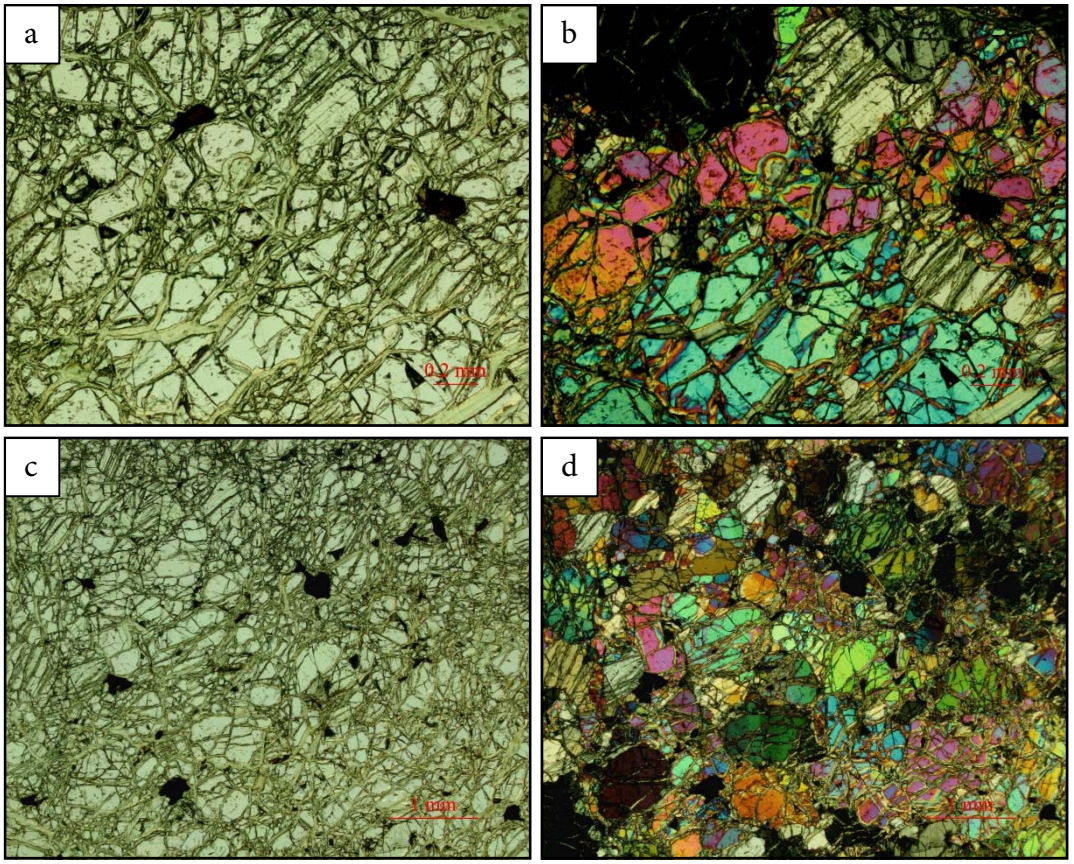
CHAPTER 6.
PETROGRAPHY AND MINERAL COMPOSITION OF MANTLE XENOLITHS OF THE LUNDA NORTE SCLM

APPENDIX

MGR-11: Spl-harzburgite

Harzburgite xenolith (40%) and kimberlitic matrix (60%). The xenolith is composed in 70% of olivine, which appears as very fractured grains, with diameters close to 2mm. These only slightly preserve the original habit due to its high fracturation. Subhedral orthopyroxene (20%) preserves its original prismatic habit, with lengths close to 1mm. There is also anhedral spinel occupying the interstitial space between olivine and orthopyroxene (<2%). Clinopyroxene is absent. Between the xenolith and the matrix, there is a thick alteration rim produced by the interaction of the xenolith with the host magma.

The kimberlitic matrix it totally serpentinised, with different stages of precipitation of serpentine group minerals. It is impossible to determine the original composition of the matrix and differentiate the initial % of groundmass olivine. The serpentine from the inner part of the grains is very fine-grained, with grey IC and undulose-radial extinction; whereas in other cases it forms small laths with IC up to yellow of 1st order. As a xenocrysts there are also some garnets (rounded, with rim reaction and diameters between 0.5 and 2.5mm). There are also some small crystals of phlogopite.

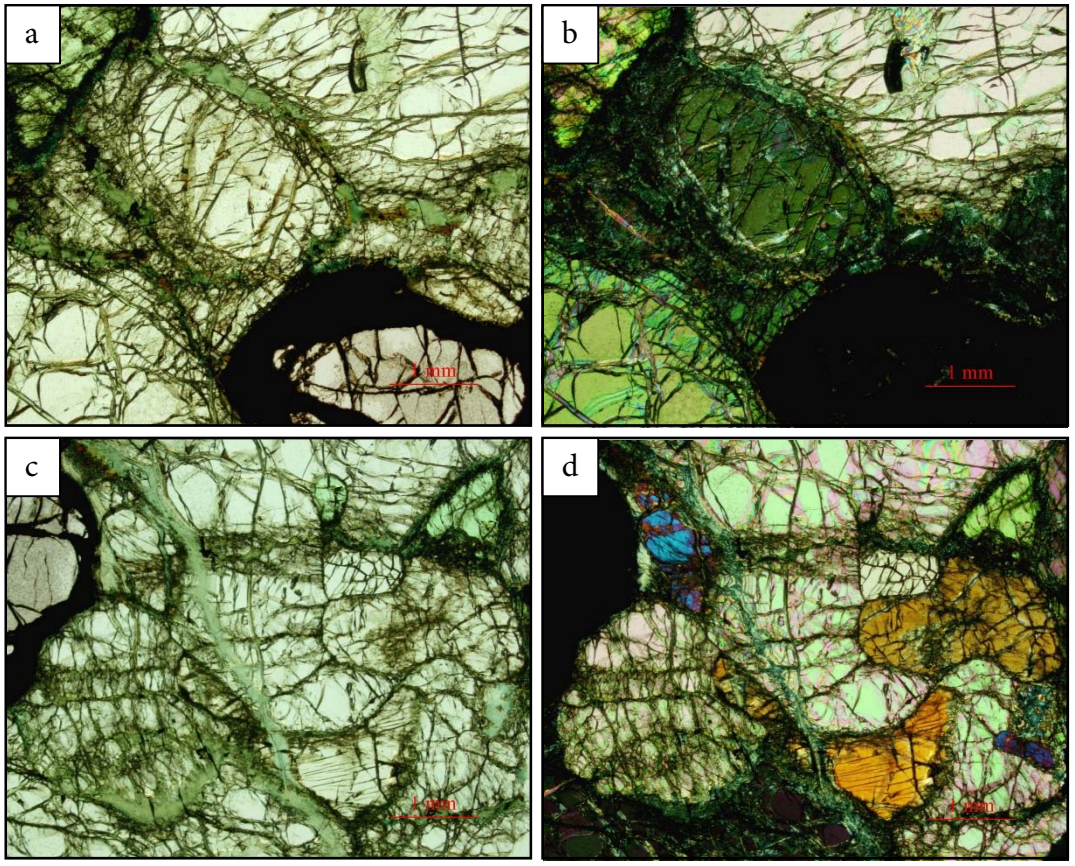


T: 630 ± 41 ºC
P: 27 Kbar

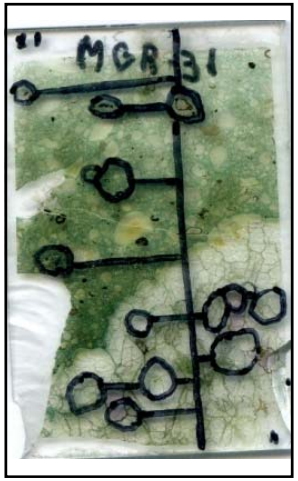
MGR-34: Grt-Wehrlite

Wherlite. Coarse garnet peridotite. Large (up to 6 mm) olivine grains, significantly altered to serpentine and fractured, form the 70% of the xenolith. Garnet grains are also large (5mm), have reaction rims of biotite/phlogopite and represent 10% volume of the xenolith. Compared to other mantle xenoliths, this peridotite has higher abundances of interstitial Cr-diopside (8%) and almost no orthopyroxene (<2%), which never exceeds 2mm in length. No evidences of deformation were seen in this xenoliths.

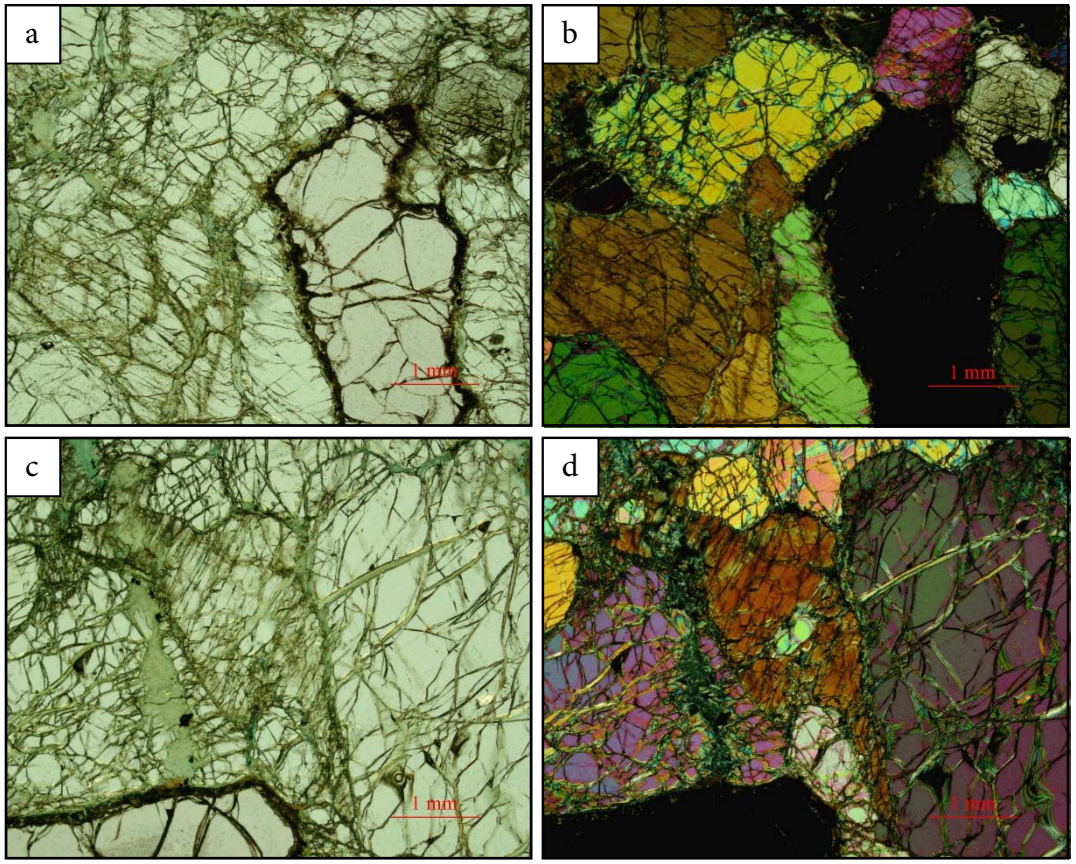
T: 856 ± 20 ºC
P: 38 ± 2 Kbar



MGR-31: Grt-Harzburgite

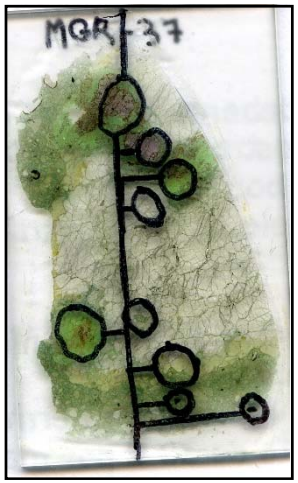


Harzburgite. Coarse garnet peridotite, composed of large (4-7 mm) and relatively unaltered olivine grains (70%), orthopyroxene (12%) and garnet (7%). Orthopyroxene is subhedral and its grain size ranges from 2 to 5 mm. Some of these grains contain very thin lamellae of clinopyroxene. Garnet (1-3 mm) is subhedral and it has reaction rims of fine grained biotite and chromite. Euhedral clinopyroxene was found as inclusion in olivine, being less than 1% of the whole xenolith. There is also interstitial secondary carbonate? (<5%). Serpentinisation occurred along grain boundaries, fractures and foliation planes of the silicates, representing up to 6% of the volume of the xenolith. Small euhedral magnetite crystals derived from alteration of olivine can be found in the serpentine.
The boundary between the xenolith and the kimberlitic matrix forms an aureole of 1-2 mm width, composed of serpentine group minerals. The kimberlitic matrix is totally serpentinised, and so occurs with the primary olivine xenocrysts (diameters between 1 and 4mm). There are very few opaque minerals in the sample.



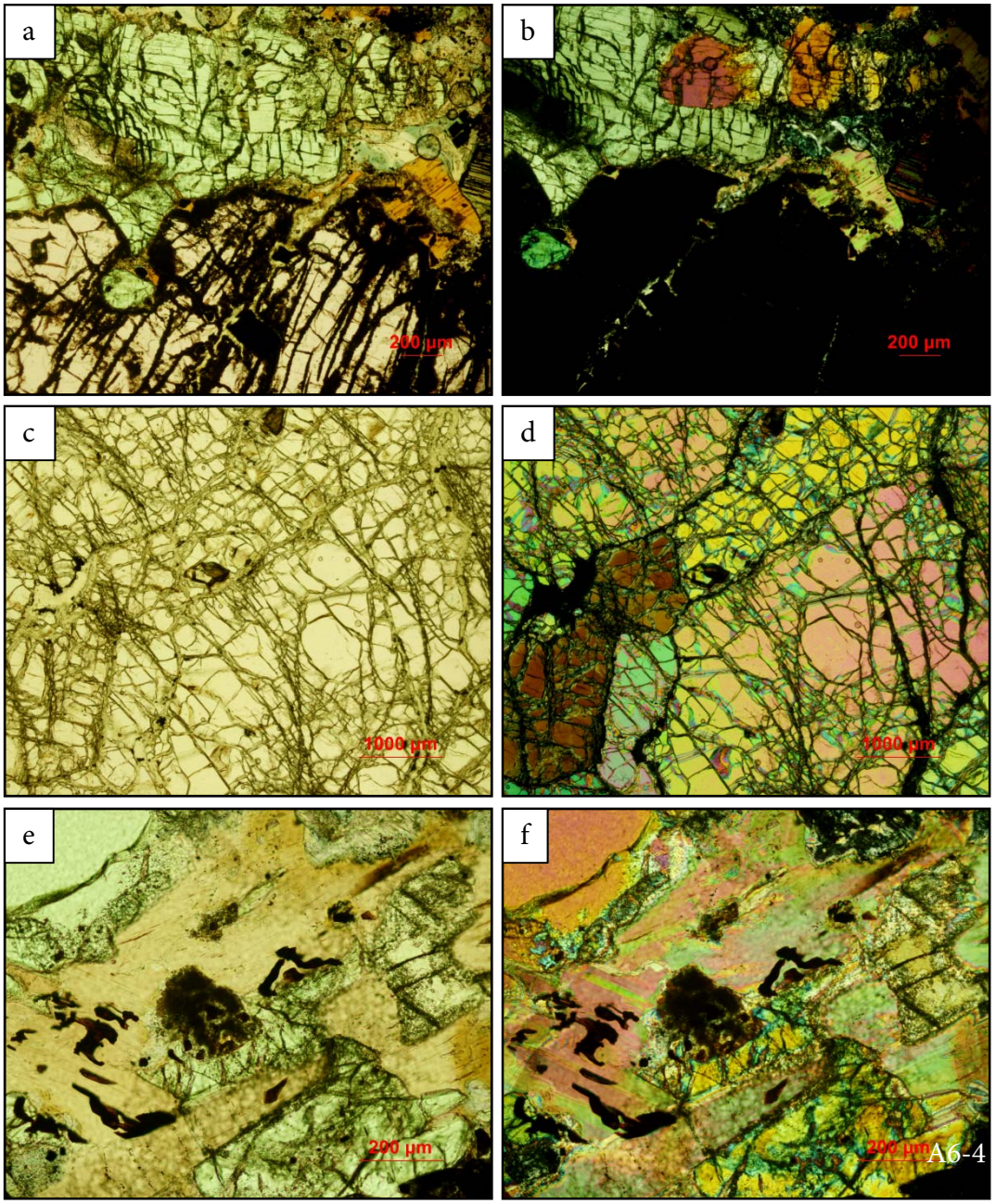
PT conditions:
T: 795
P: 35 Kbar

MGR-37: Grt-wehrlite

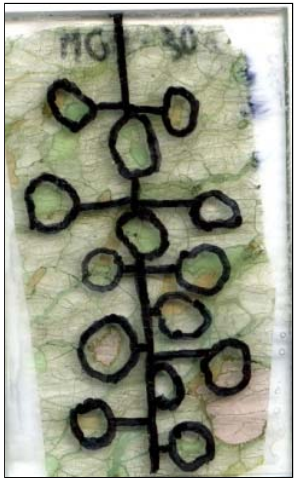


Grt-wehrlite xenolith. It is formed mainly by fresh crystals (although fractured) of olivine (75%) and only slightly altered to serpentine through fractures. There are also some anhedral crystals of Cr-diopside (10%) and euhedral phlogopite, which appears as tabular crystals of less than 1 mm length (<2%). There are also garnet crystals (a-b), of 1-3 mm in diameter (10%), surrounded by Cr-diopside + oxides (chromite) + phlogopite (see images e-f). The kimberlitic matrix is composed of submillimetric-sized, rounded olivine rounded grains, which are totally altered to serpentine. There is reaction rim between the xenolith and the kimberlitic magma.

T: 884 ± 42 ºC
P: 40 ± 2 Kbar

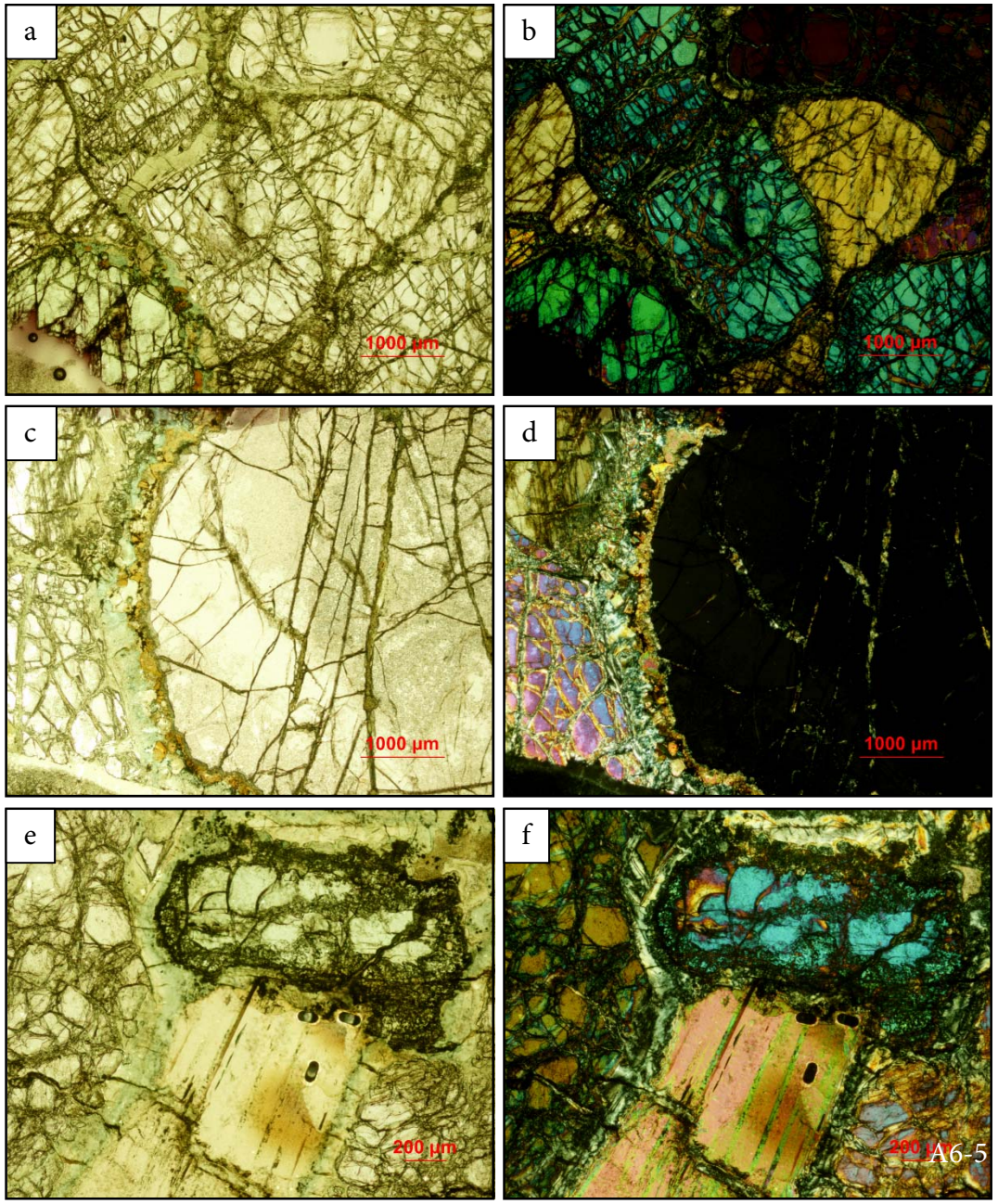


MGR-30A: Grt-Lherzolite

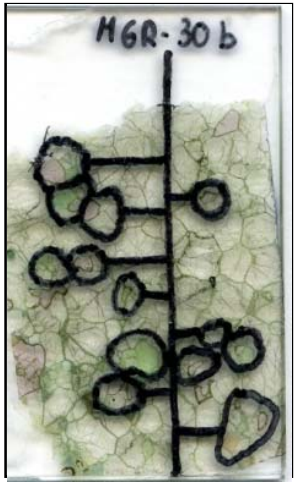


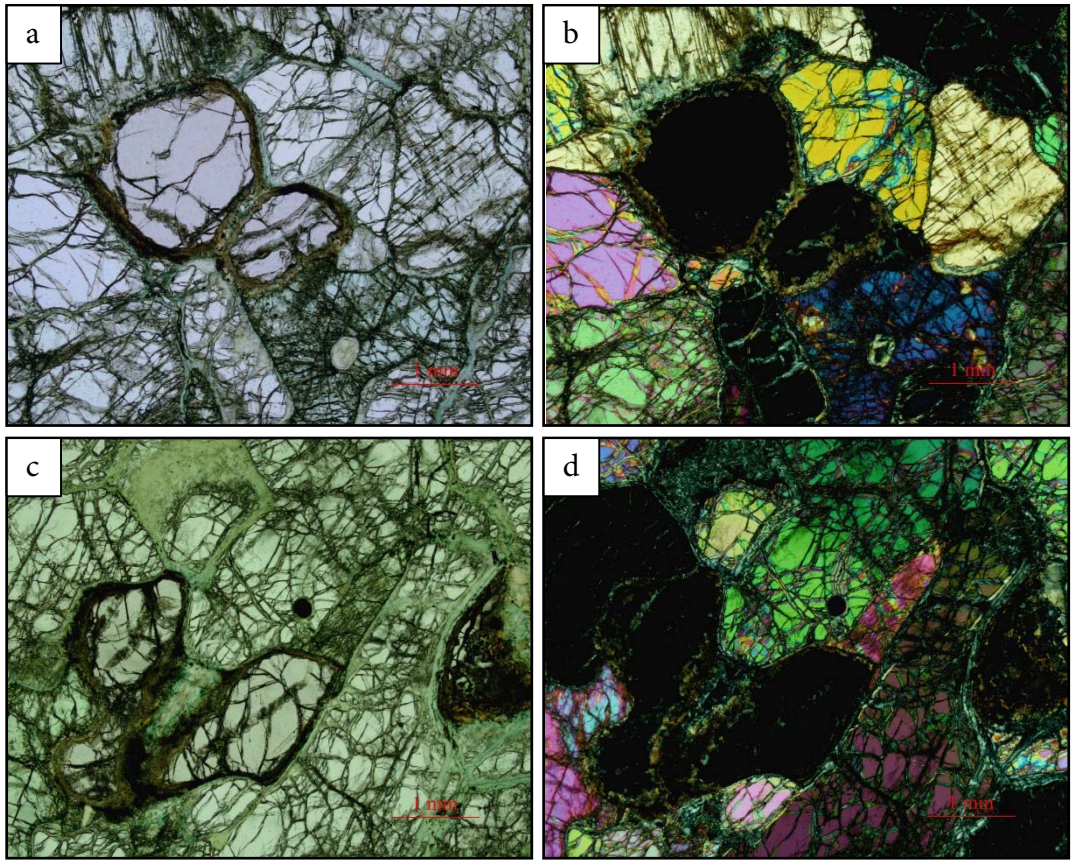
Lherzolite xenolith, mainly composed of fresh, equant and rounded grains of olivine (65%), with diameters ranging between 1 and 10 mm. There are also 2 rounded, reddish, garnet grains, subhedral. One of them with diameter of 4 mm and the other one, 10 mm (10%). Orthopyroxene represents less than 10% of the xenolith and its grain size ranges from 0.5 to 2 mm. Phlogopite is abundant (3%) and forms tabular crystals up to 1 cm in length and 3mm width. In addition, many anhedral grains of Cr-diopside of less than 1 cm were observed (8%). At the boundaries there is an alteration to serpentine group minerals (5%). Opaque minerals are practically inexistent (chromite, hematite...)

T: 866 ± 27 ºC
P: 41 ± 2 Kbar



MGR-30B: Grt-Lherzolite (II)

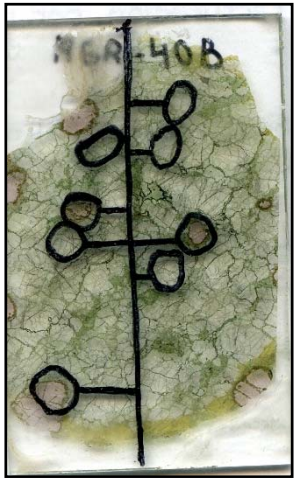


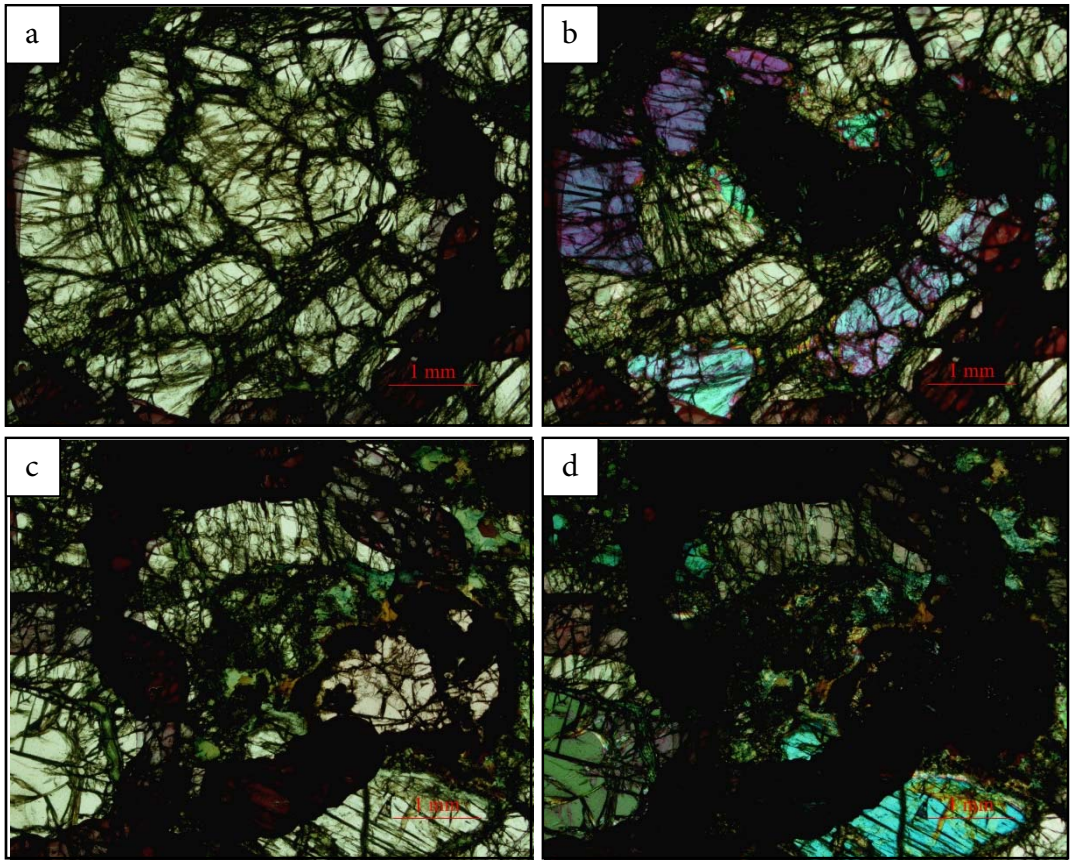


Another section of the same lherzolite xenolith, mainly composed of fresh, equant and rounded grains of olivine (70%), with diameters ranging between 3 and 10 mm. There are also several small garnet grains (7%), of reddish colour, subhedral to anhedral, with diameters ranging from 1 to 4mm. There are also anhedral grains of Cr-diopside (7%), subcentimetric-sized; as well as some orthopyroxene grains (9%), which are usually smaller than 2mm. Locally some euhedral grains of phlogopite has been observed (up to 1.5 mm) (<1%). This sample is very fresh, although it shows an slight alteration to serpentine through olivine grain boundaries and there is also an alteration rim (Fe oxides) around the garnet grains. There is no opaques (only some chromite and hematite related to the serpentinisation).

T: 929 ± 44 ºC
P: 42 ± 2 Kbar

MGR-40B: Grt-Harzburgite





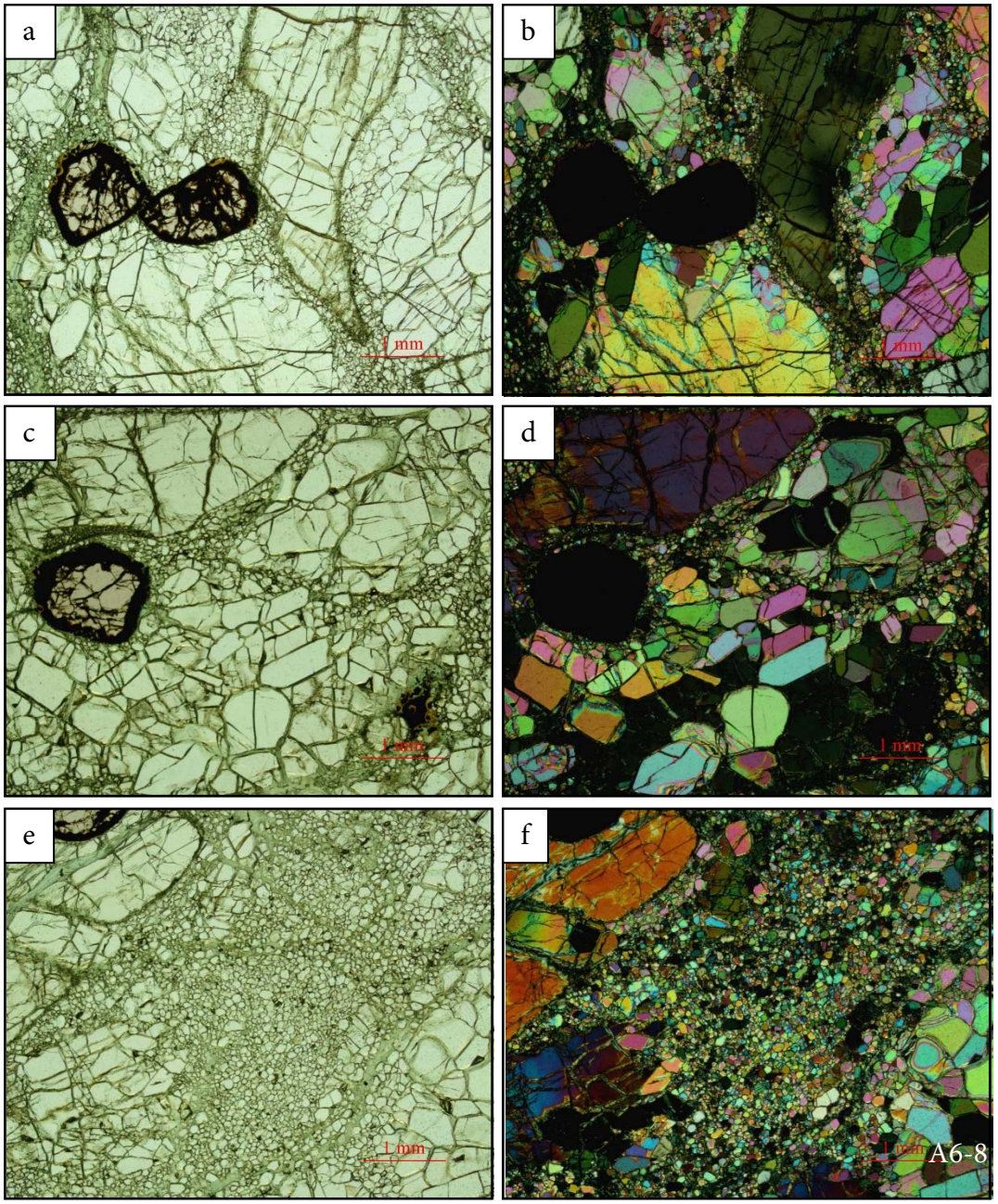
Harzburgite xenolith, composed mainly of rounded, fractured but fresh, crystals of olivine (70%). There is also abundant subhedral, orthopyroxene crystals (15%). Their length ranges between 1 and 4 mm. There are also some garnet grains, of 1-6 mm in diameter, very rounded and with a reaction rim of oxides (10%). Phlogopite is locally present (<1%). The sample is slightly serpentinised.

T: 1080 ºC
P: 53 Kbar

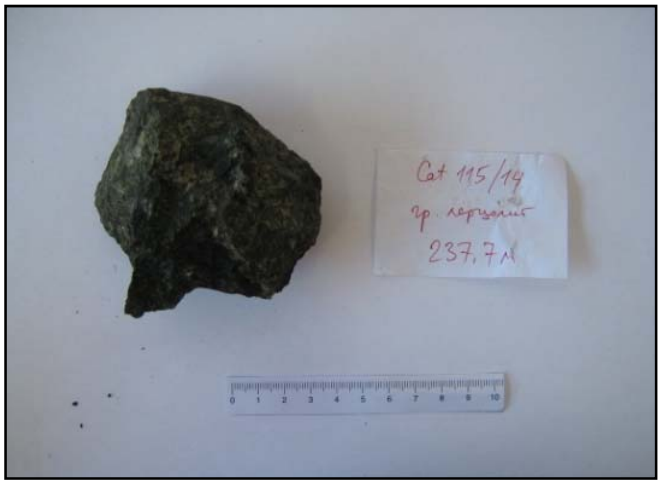
MGR-32B: Grt-Harzburgite

Harzburgite. Sheared garnet peridotite with only slight serpentinisation along the grain boundaries. It is mainly composed of olivine (75%), with abundant orthopyroxene (17%) and small amounts of garnet (<3%). Three generations of olivine were found: i. coarse olivine (diameters ≈ 4mm), ii. euhedral (0.25 x 1mm) olivine and iii. rounded olivine neoblasts (< 0.1 mm). Orthopyroxene is subhedral, with grain sizes ranging from 2 to 5mm, and shows evidences of deformation (undulose extinction). Garnet grains are small (0.5-1mm), rounded and typically show minor reaction rims of biotite and chromite. No clinopyroxene was found in this xenolith.

T: 1216 ± 12 °C
P: 60 ± 1 Kbar

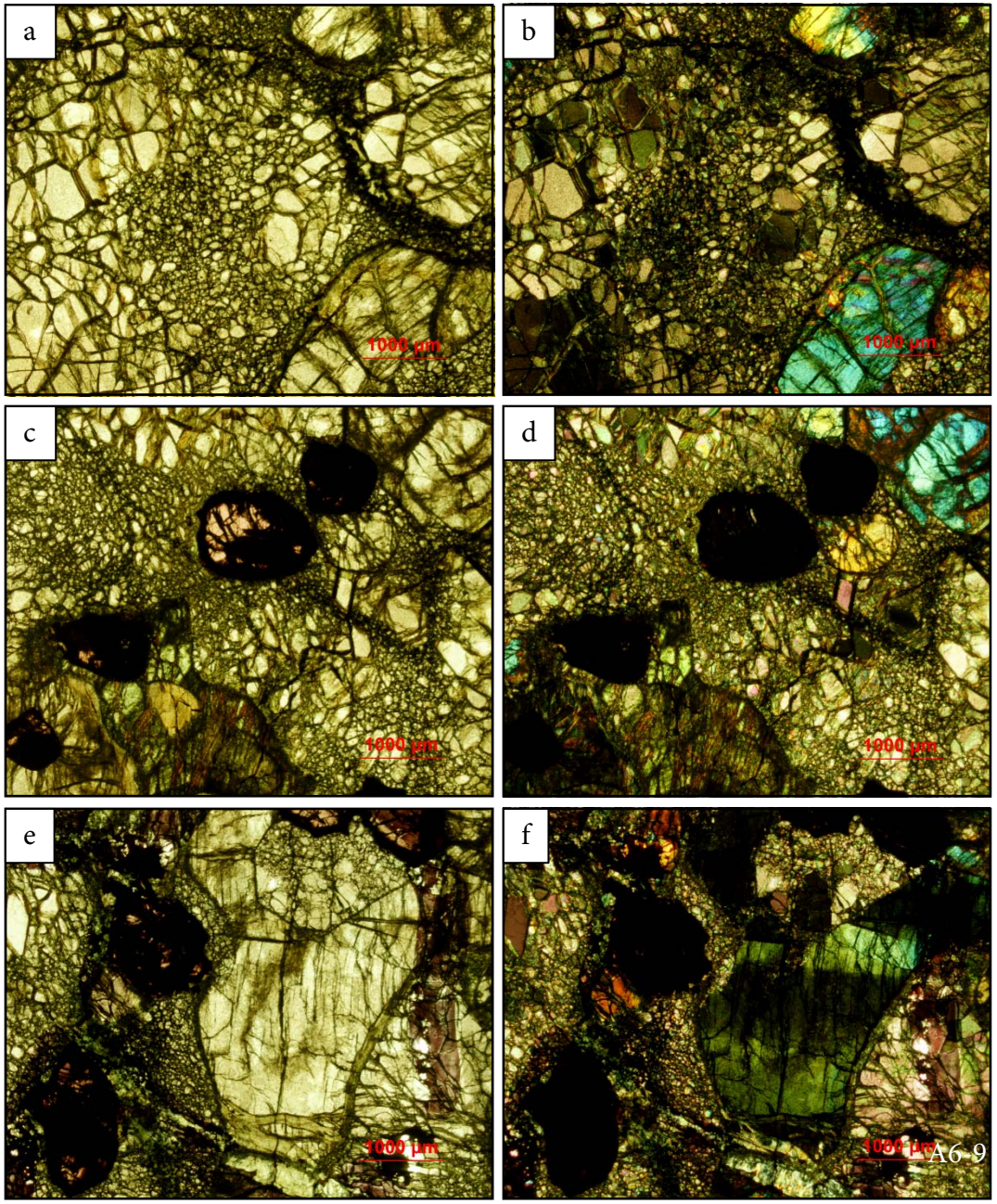


MGR-12: Grt-Harzburgite



Harzburgite. Sheared garnet peridotite composed mainly by subrounded olivine crystals (65%), partially altered to serpentine along grain boundaries and cracks. Olivine occurs either as coarse grains (5-12 mm) or as rounded, small (0.2 mm) olivine neoblasts, which are found in the interstitial space between the silicates. Orthopyroxene is also present (17%) and it has also been replaced by serpentine group minerals. Its grain size ranges from 1 to 4mm (maximum length) and it typically presents undulose extinction. Rounded garnet grains constitute 8% of the xenolith. With only few exceptions, garnet size is commonly smaller than 1mm and presents very thin reaction rims. There are some anhedral Cr-diopside grains (<3%). Serpentinisation products can be up to 8 % of the xenolith.

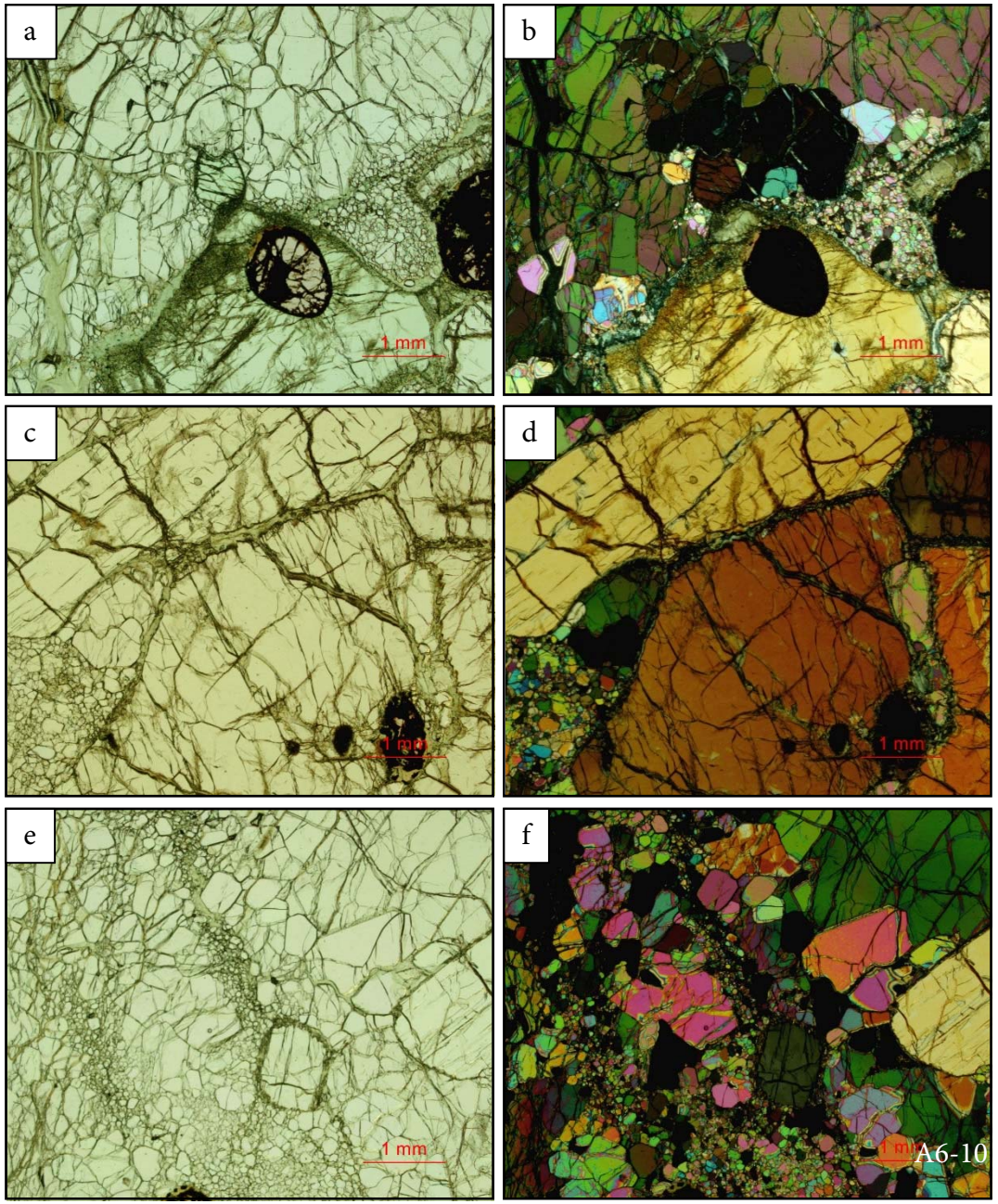
T: 1332 ± 48 ºC
P: 65 Kbar



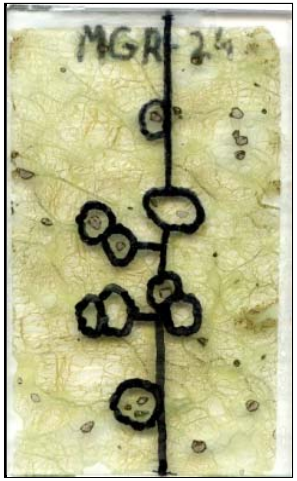
MGR-28: Grt-Harzburgite

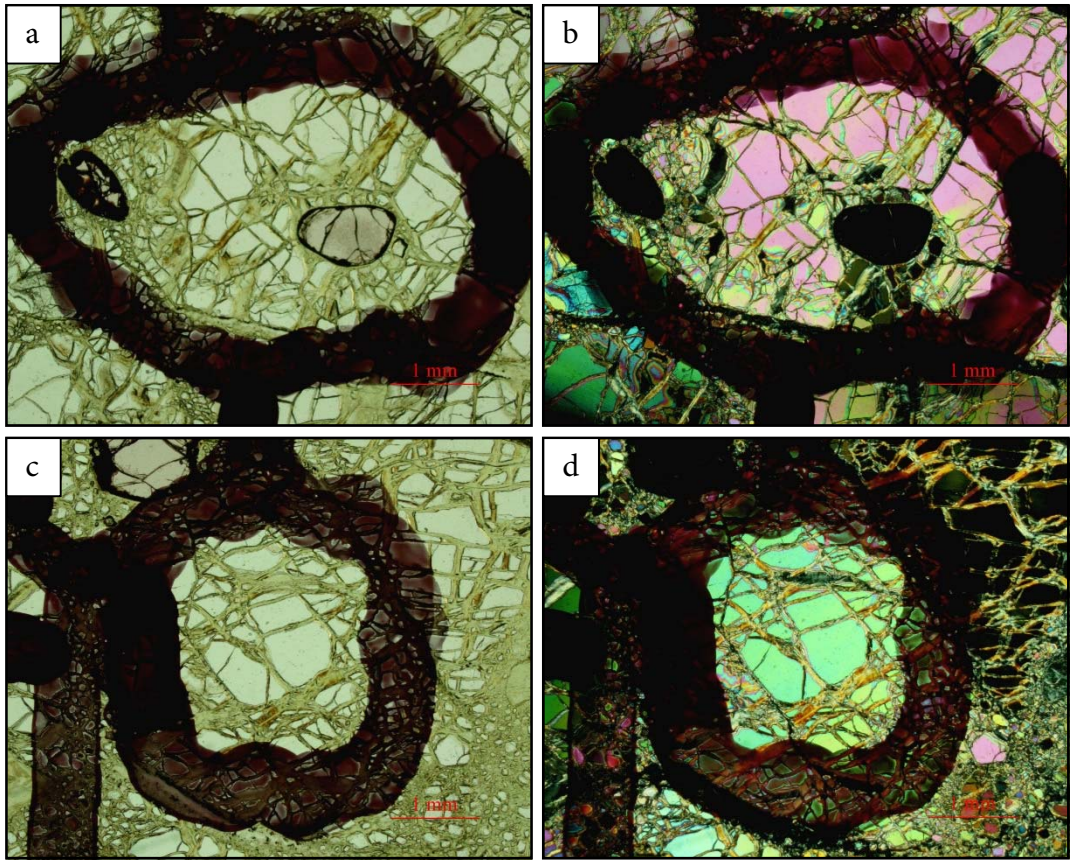
Harzburgite xenolith, very fresh, constituted mainly of olivine (60%), forming subhedral, rounded crystals, with equilibrium textures (120º). There are 3 populations of olivine: 1. Big crystals of olivine (up to 1cm length), very fractured and slightly altered to serpentine through fractures. This generation of olivine forms 15% of the xenolith and commonly presents an undulose extinction and kink bands. 2.-Medium sized grains (0.5mm approximately), forming a mosaic, placed between the other grains of the xenolith. Probably they are consequence of a recrystallization (<20%). 3.- Small neoblasts (<0.25 mm), filling the interstitial space (>30%). There are also abundant crystals of orthopyroxene (25%), subhedral and with prismatic habit, and length ranging from 2-10 mm, in equilibrium with olivine. These crystals typically show undulose extinction. Orthopyroxene neoblasts (<0.15 mm) are also found in the boundaries of some of these crystals. Finally, garnet grains, very rounded, with diameters comprised between 0.2 and 2 mm represent around 8% of the xenolith. Most of them are included in orthopyroxene and remained almost unaltered. However, some are found occupying the interstitial space between olivine and orthopyroxene. In such cases, garnet typically developed reaction rims, with serpentine minerals and euhedral oxides (magnetite). Locally some anhedral crystals of clinopyroxene (<3%), filling the interstitial space, were found.

T: 1306 ºC
P: 66 Kbar



MGR-24A: Grt-Harzburgite





Harzburgite. Sheared garnet-bearing peridotite, with two populations of olivine (65%). Coarse olivine (2-10mm) represents 35 % of the xenolith, whereas the olivine neoblasts (30%) occupy the interstitial space. Orthopyroxene is abundant (20%), its grain size ranges from 2 to 4 mm and commonly presents evidences of deformation (kink bands, undulose extinction). Garnet constitutes approximately 3% of the rock and it occurs as small (0.5-2mm, usually around 1mm) rounded crystals. Most of the garnet grains are poorly altered and only a minor amount present reaction rims of biotite and magnetite. Clinopyroxene is very rare (<2%) and occurs as anhedral grains of clinopyroxene. This sample is slightly more altered to serpentine than other xenoliths sampled by the kimberlite.

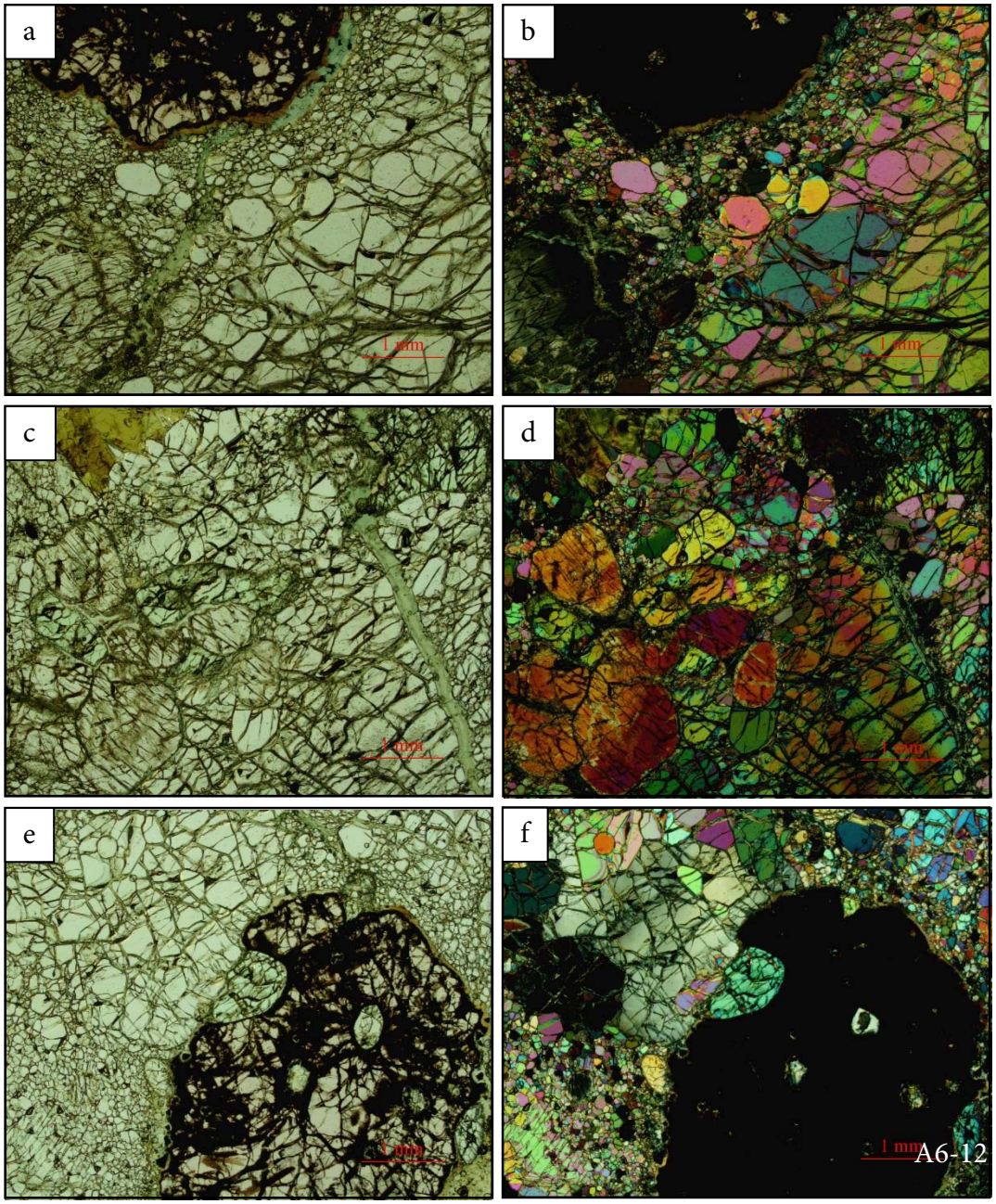
T: 1326 ºC
P: 70 Kbar

MGR-10: Grt-Lherzolite

It is formed mainly by quite fresh crystals (although fractured) of olivine (65%), with variable diameter. There are 2 different populations of olivine: a) Large crystals, up to 1cm length, fractured; and b) small crystals (neoblasts), usually near the boundaries of the xenolith, with diameters ranging from 0.1 and 0.5 mm (35%). They are only slightly altered to serpentine through cracks. Orthopyroxene crystals (15%), subhedral, occur in equilibrium with garnet and olivine and with lengths between 1 and 4 mm. There are several rounded grains of garnet (10% of the whole xenolith), with diameters between 2 and 4 mm. Inside some garnet grains, there are some euhedral, opaque, submillimetric-sized crystals (chromite). Finally there are small anhedral crystals of clinopyroxene (Cr-diopside), intergranular (¿metasomatism?) and other grains which are clinopyroxene (see images e-f). In total they are the 5% of the rock. The boundaries of the xenolith are totally serpentinised and they present one garnet grain (with rim reaction) and pyroxenes. There have been, at least, 3 generations of serpentine (5%): 1. alteration of olivine and/or pyroxene; 2. within cracks in the minerals and 3. in bigger cracks, cryptocrystalline.

T: 1279 ± 21 ºC

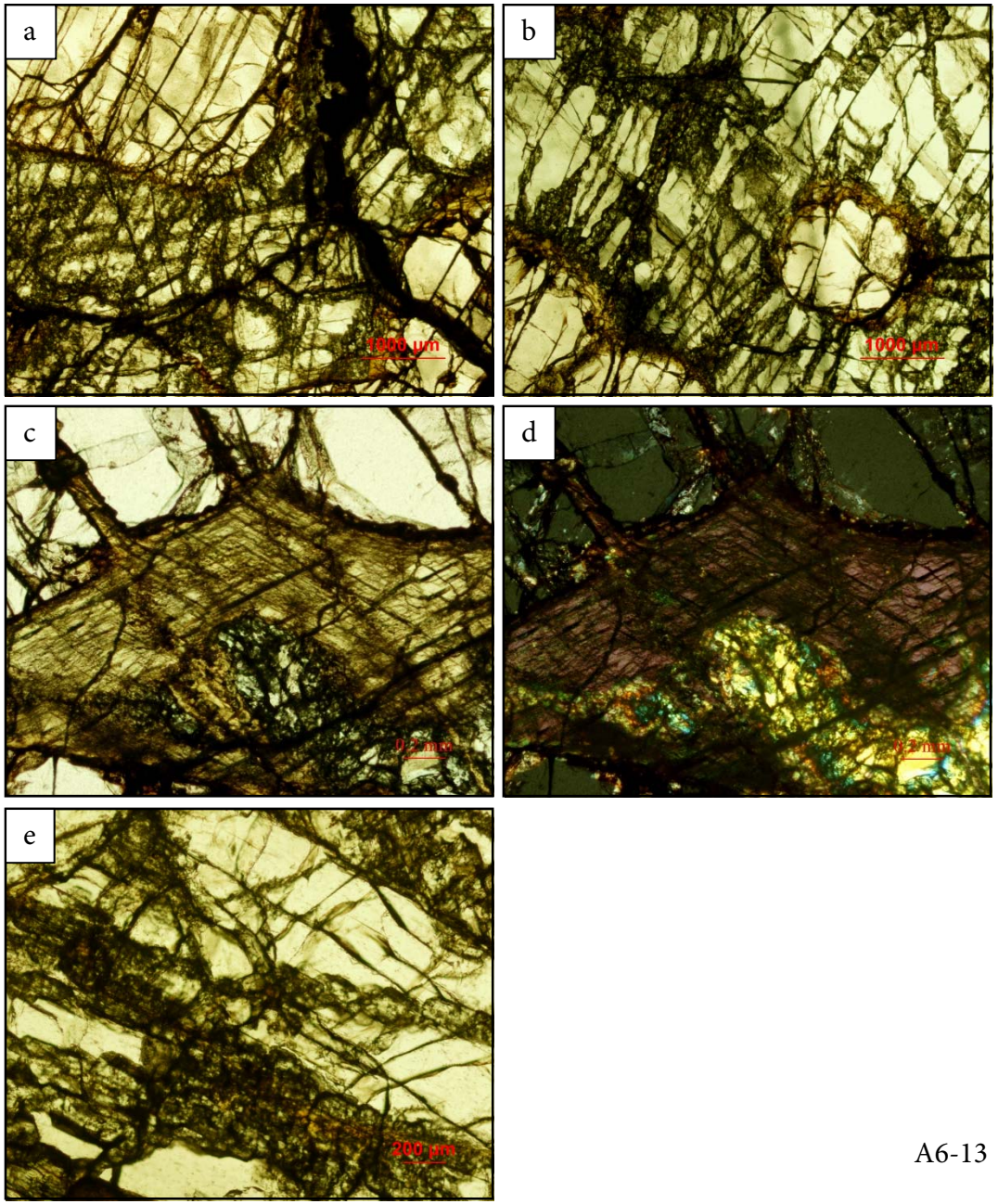
P: 63 ± 1 Kbar



CAT-18: high-Mg eclogite

Eclogite composed of 50% clinopyroxene and 45% of garnet. The size of the garnet crystals ranges from 1 to 10 mm and they are rounded in shape. Apart from the original clinopyroxene crystals, a second generation of clinopyroxene has been identified. It is composed of fine-grained clinopyroxene, located near the fractures. This xenolith presents evidences of mantle metasomatism, such as interstitial phlogopite (<3%) and amphibole?, accompanied by minor amounts of opaque minerals, such as rutile (<1%).

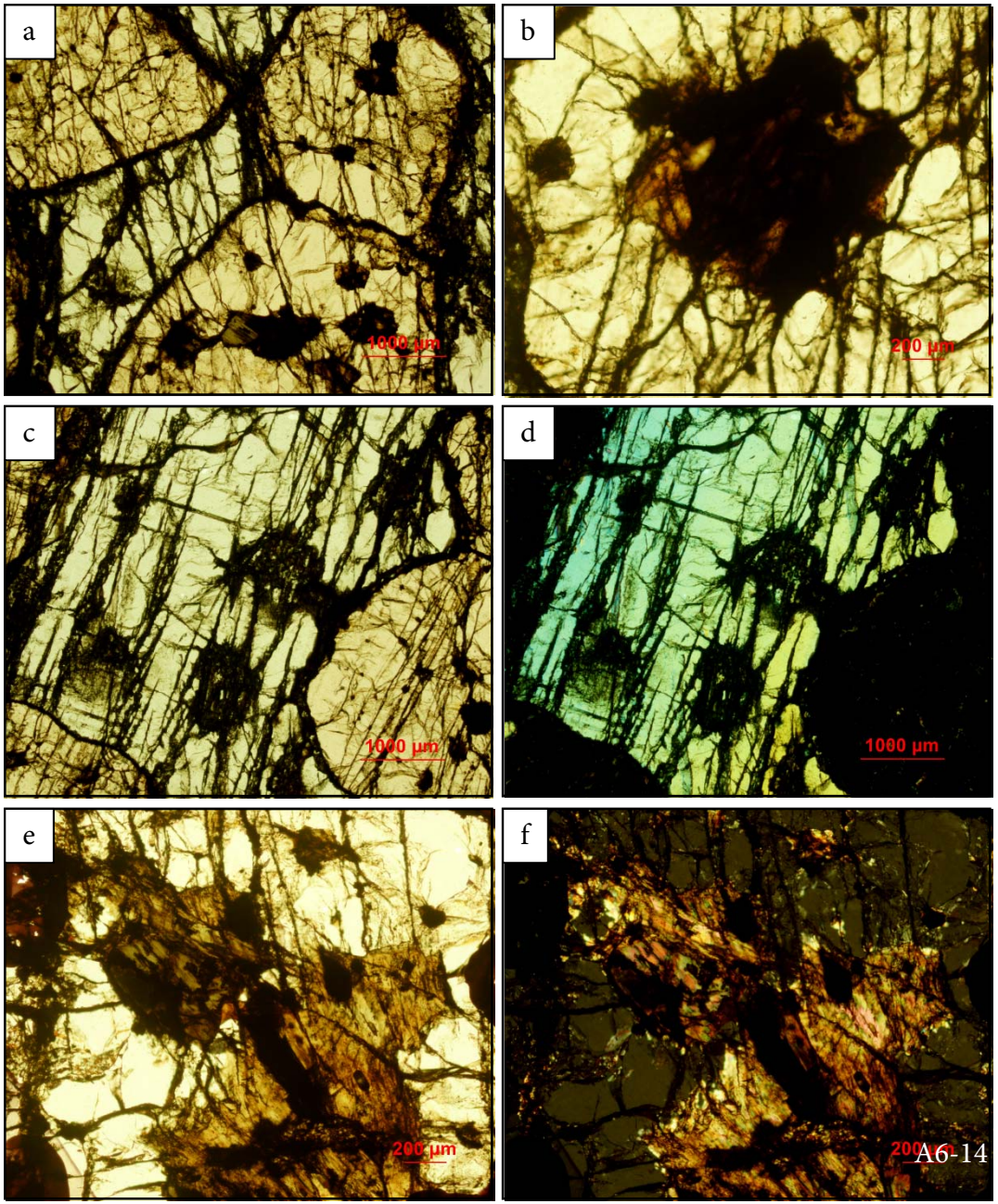
T: 1277 ºC
P: 57 Kbar



CAT-34: low-Mg eclogite

Eclogite composed of 70% of garnet and 30%of clinopyroxene. Garnet grains in this sample present a lot of inclusions that could be related to melt pockets as described in other eclogites worldwide. These inclusions contain complex oxides and locally phyllosillicates.

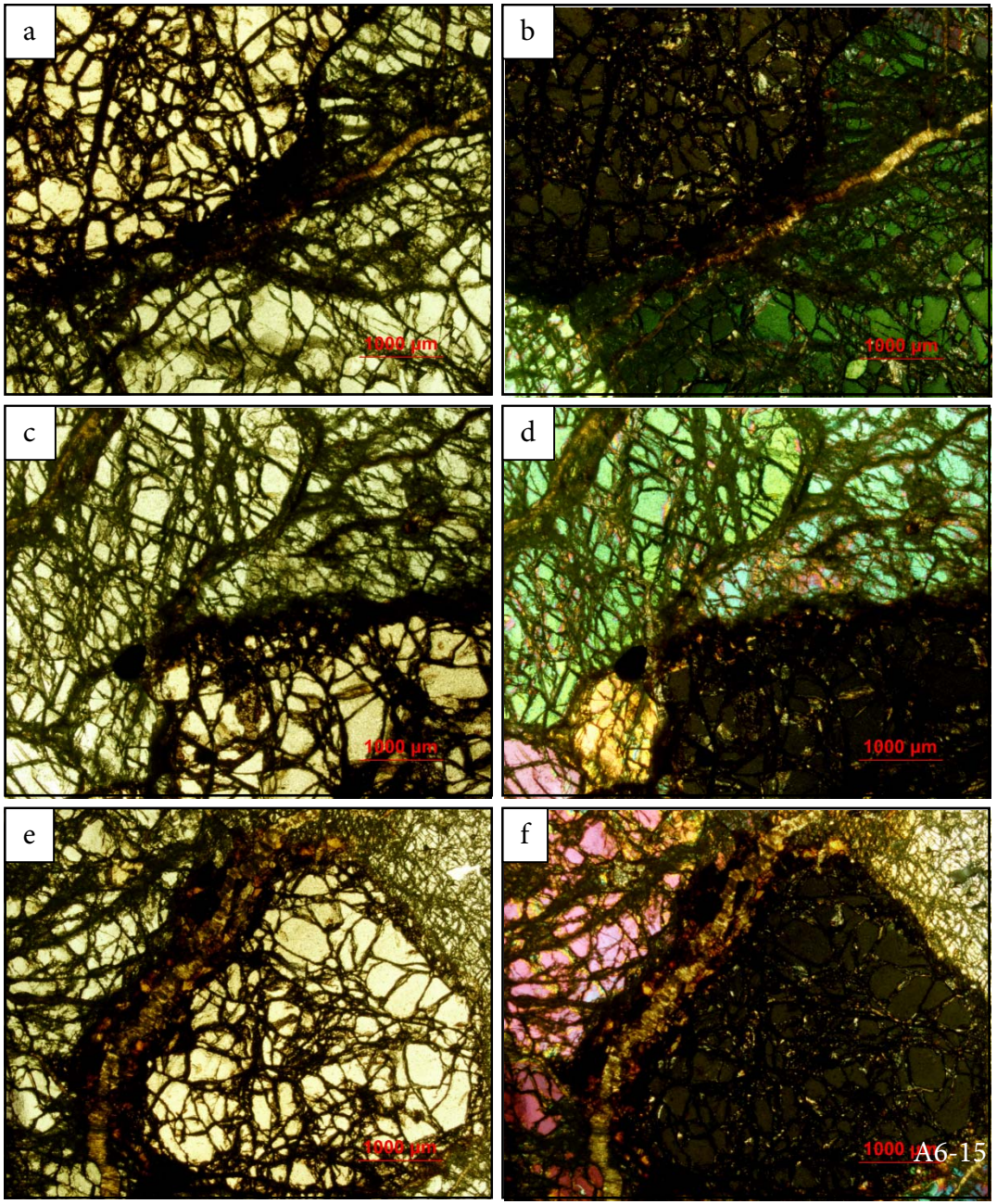
T: 1038 ºC
P: 43 Kbar



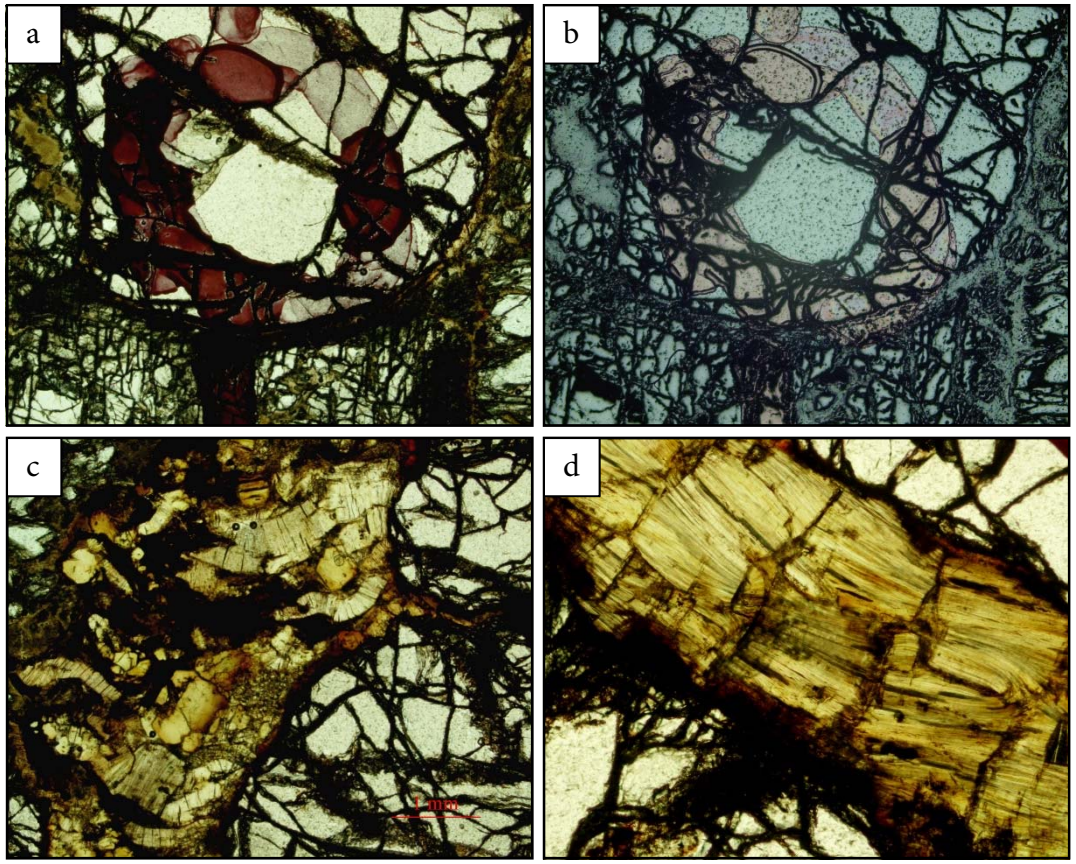
CAT-41: low-Mg eclogite

Eclogite xenolith composed of 50% of rounded garnets, with diameters up to 1 cm. These garnets are in equilibrium with clinopyroxene (50%). Although these crystals are fractured, they do not present significant alteration nor melt inclusions like those observed in the other low-Mg eclogite.

T: 1139 ºC
P: 49 Kbar



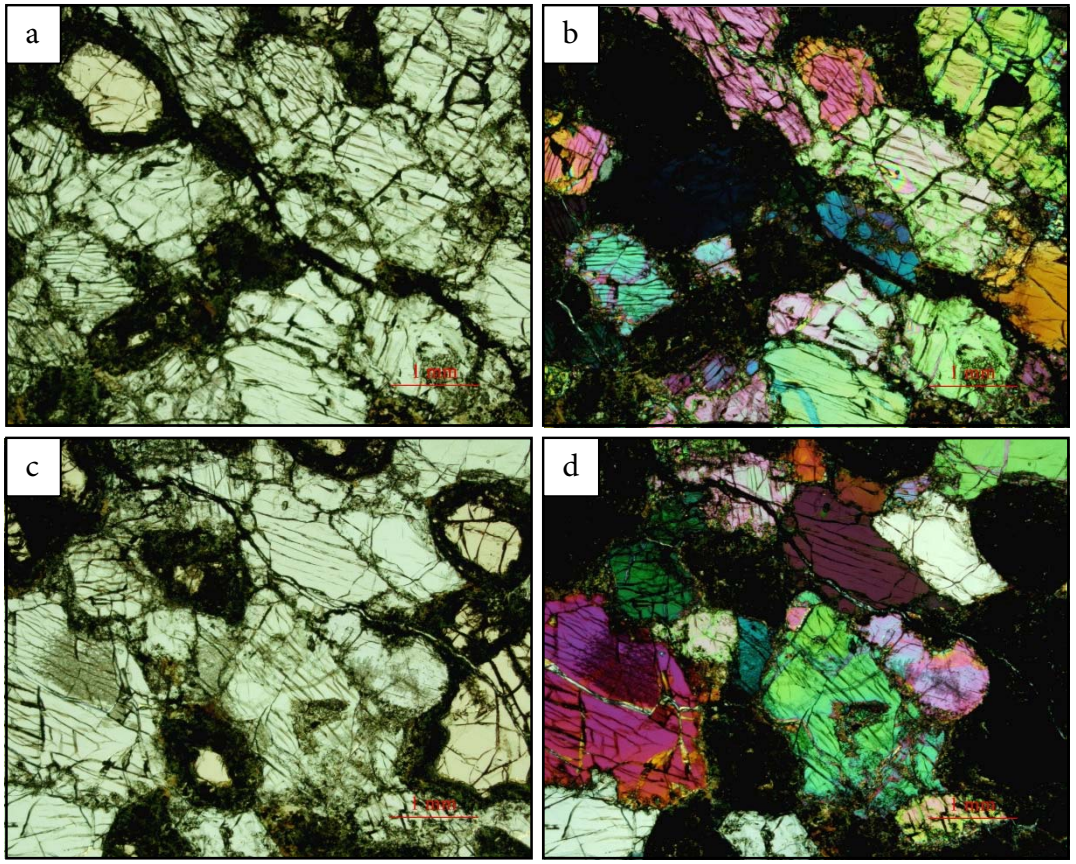
CAT-26: Grt-pyroxenite



Metasomatised garnet pyroxenite, composed of 50% of garnet, 45% of clinopyroxene, which show equilibrium textures. The rock is equigranular and the average grain size is 1 cm. The xenolith is crossed by 2 to 5 mm width phlogopite vein, which invokes for significant phlogopite metasomatism. This xenolith contains few rutile grains (<2%). Garnet grains show no retrogradation, although clinopyroxene is partially altered to serpentine group minerals.

T: 853 ºC
P: 33 Kbar

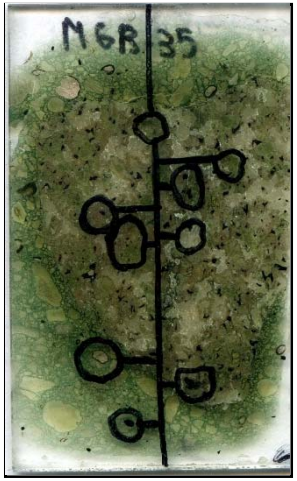
MGR-13: Grt-pyroxenite



Partially altered Grt-pyroxenite xenolith. Rock formed of clinopyroxene (65%) and garnet-grossular (35%). Omphacite show a preferred orientation, are fractured and have lengths comprised between 0.5 and 3mm. They are subhedral and have crystallised in equilibrium with the garnet crystals. These have experienced a high retrograde process (¿by late hydrothermal fluids?) and have been altered to a very dark green, cryptocrystalline mineral. Therefore, from the 35% original, only 10% has been preserved unaltered. They have orange colour, with diameters ranging between 0.5 and 1 mm, both rounded and subangular shapes (due to fracturation and non-equal alteration).

T: 881 ºC ?
P: 41 Kbar ?

MGR-35: granulite

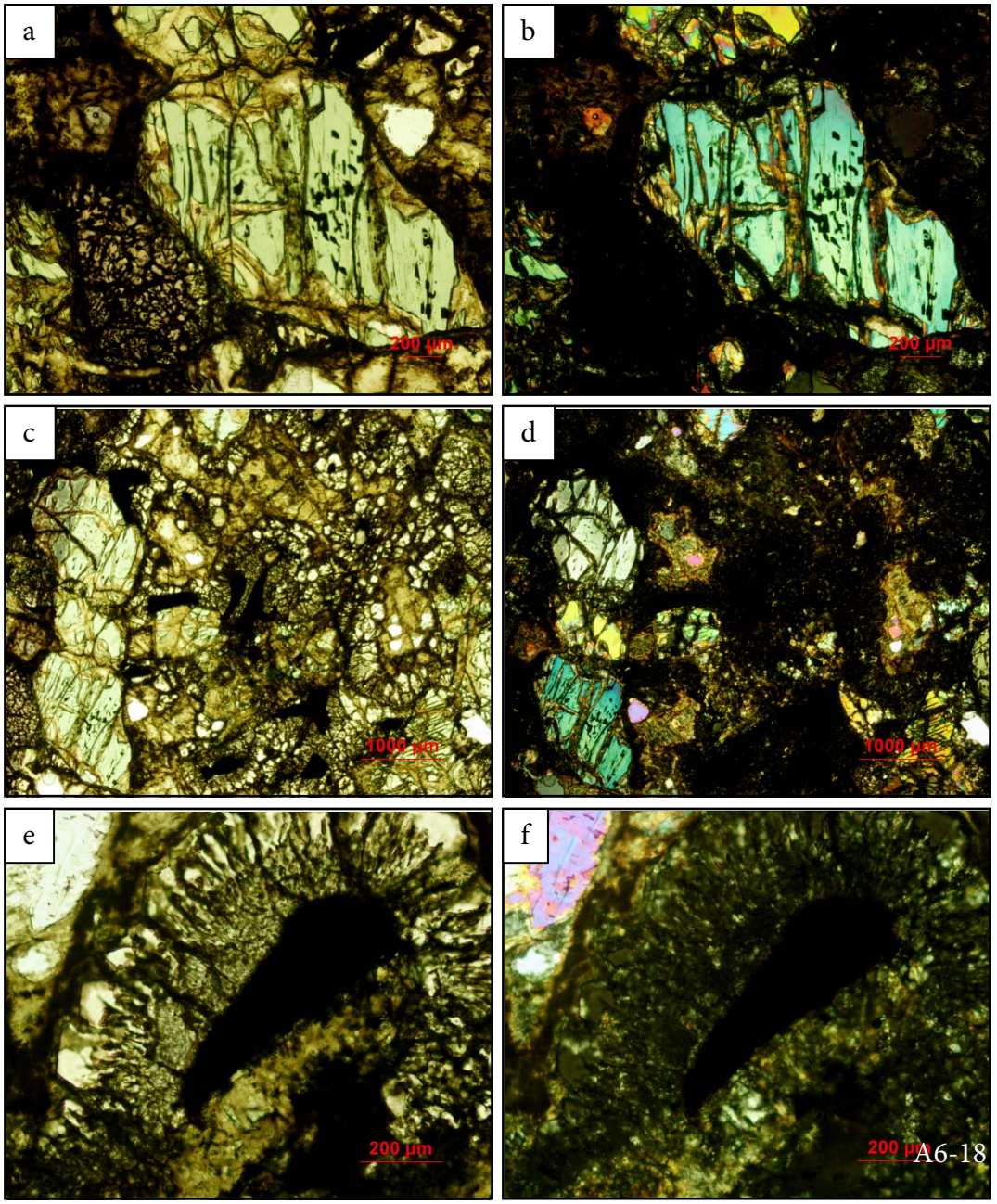


Granulite? This sample is highly serpentinised. It is composed of crystals of clinopyroxene, which are fresh and present a typical pale green colour (40%). Some of them present very small, prismatic inclusions of oxides. This rare xenolith contains abundant garnet, which typically occurs interstitially between the other mineral phases of the assemblage, as well as surrounding ilmenite. It represents up to 45% of the xenolith. Additionally, few partially replaced crystals of olivine were also found in the xenolith, although they do not form more than 4% of the xenolith. Anhedral ilmenite grains are also present, although they are less than 1% of the xenolith.

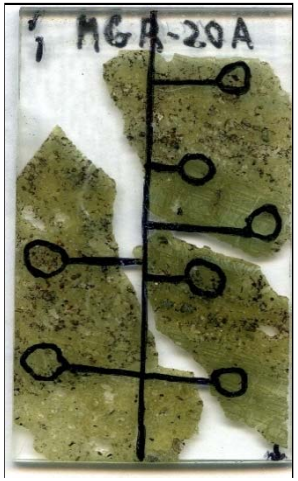
The kimberlitic matrix (30%) present olivine grains, totally altered to serpentine, of 1-3 mm in diameter. There are also garnet xenocrysts (<2mm) and opaque minerals (ilmenite, magnetite).

T: 890 ºC

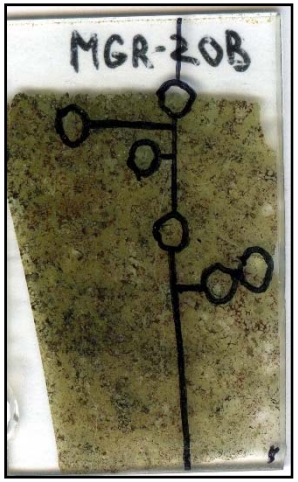
P: 35 Kbar

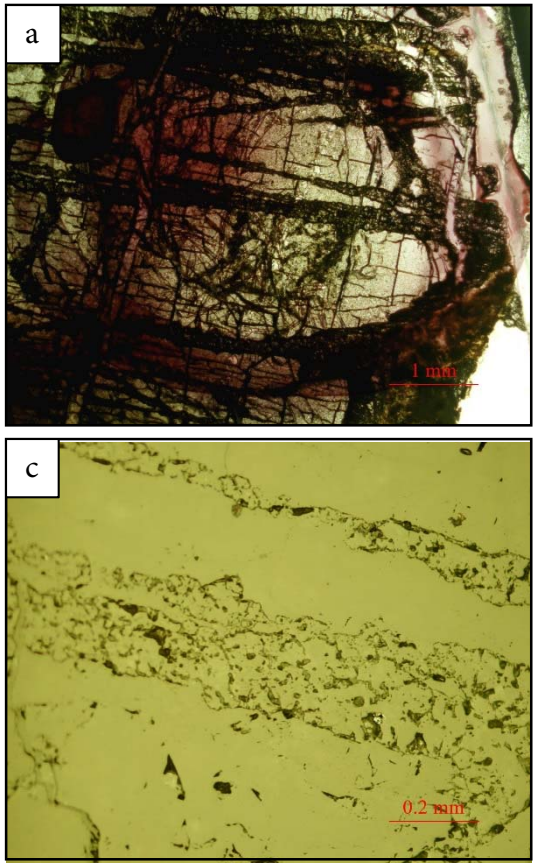


MGR-20: clinopyroxene megacrysts

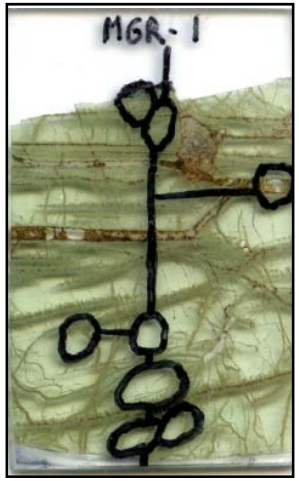


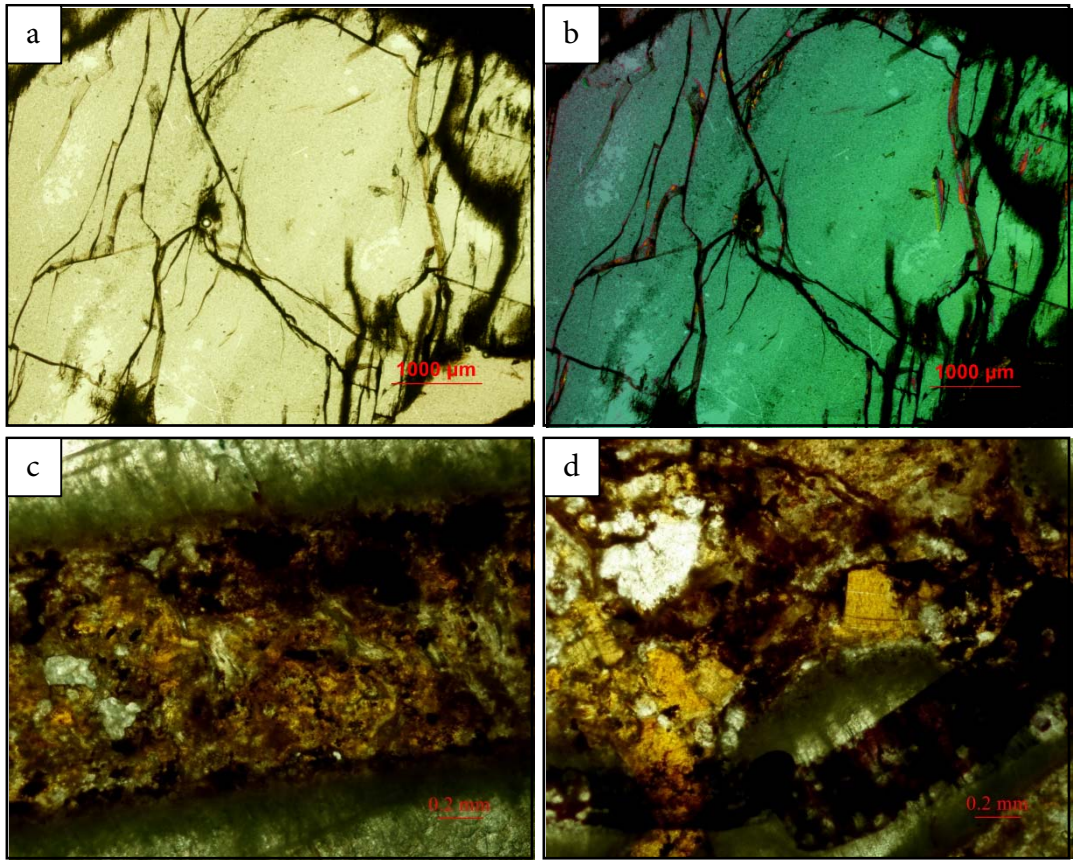
All the clinopyroxene megacrysts included from now on present similar features. They are usually characterised by coarse clinopyroxene crystal, which can be partially replaced by fine grained clinopyroxene along fractures. Moreover, in some fractures typical metasomatic minerals such as phlogopite can be observed.





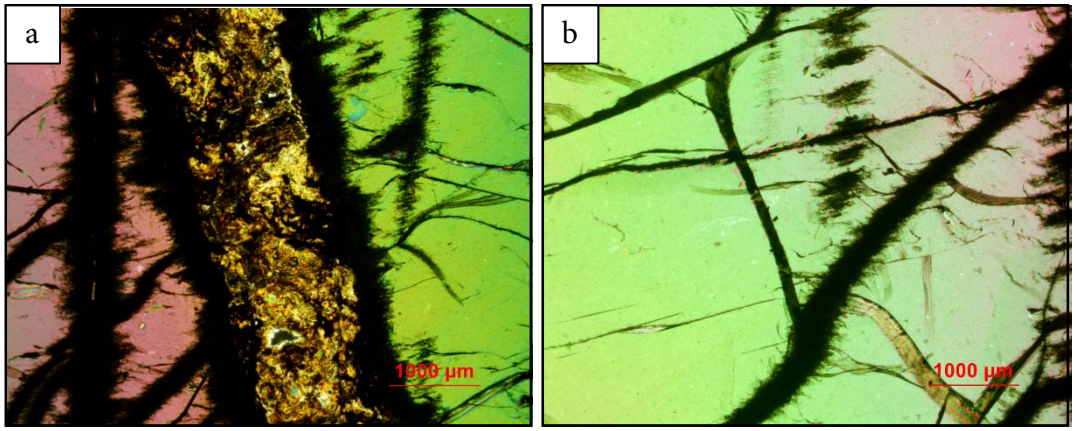
MGR-1: clinopyroxene megacryst

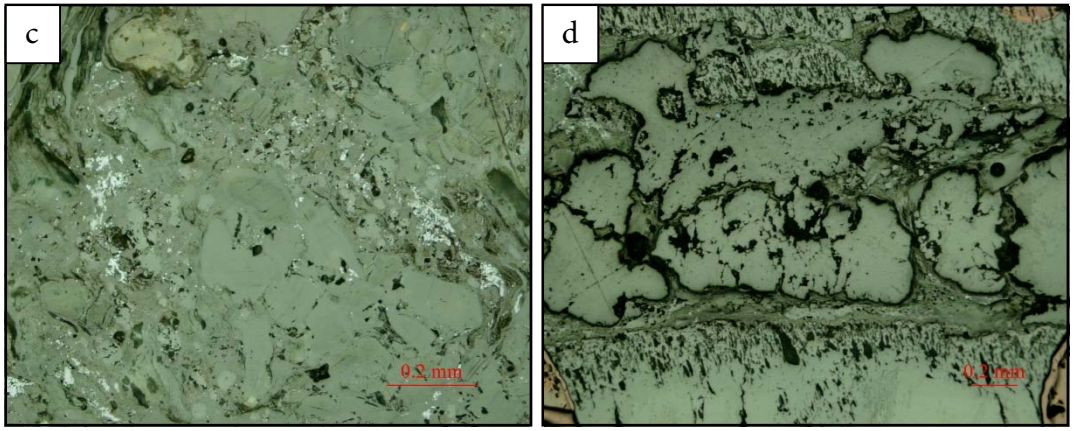




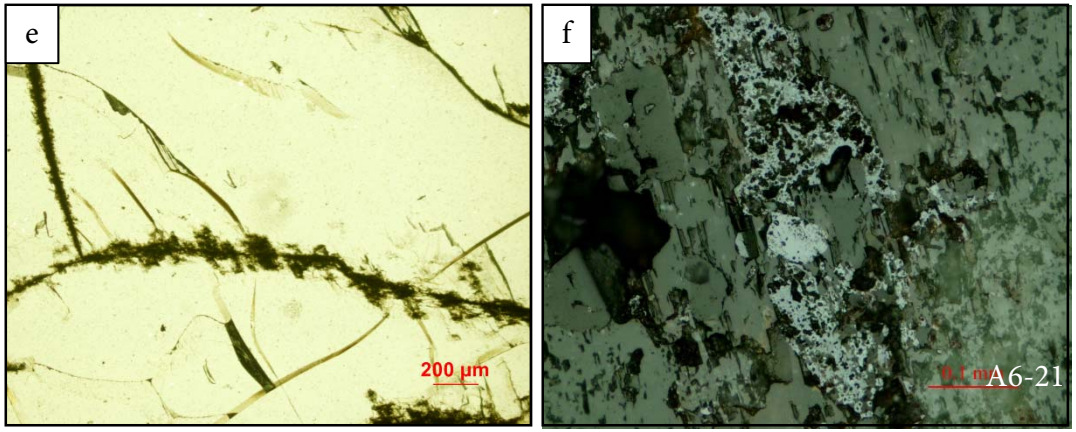
CAT-84: clinopyroxene megacryst

CAT-86: clinopyroxene megacryst

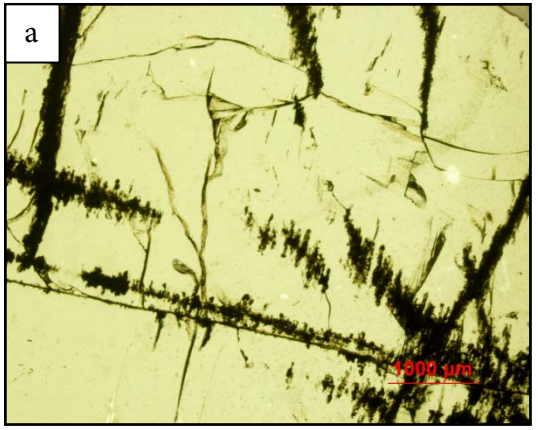


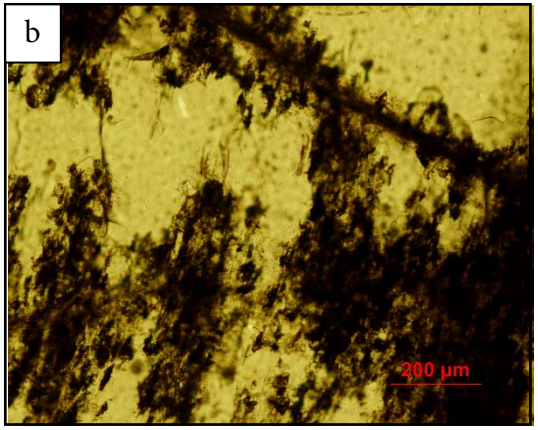


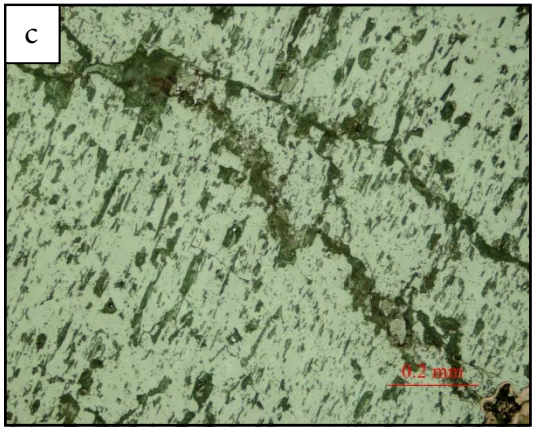
CAT-94: clinopyroxene megacryst



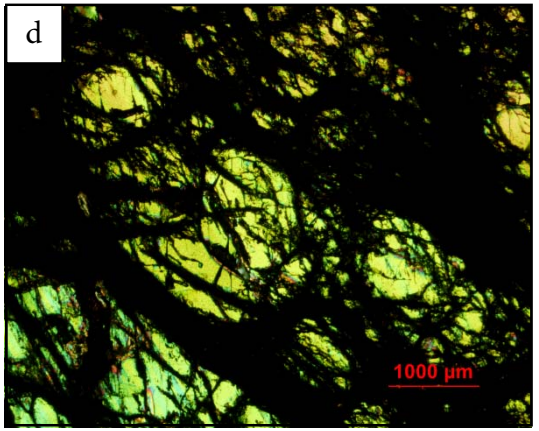
CAT-95: clinopyroxene megacryst



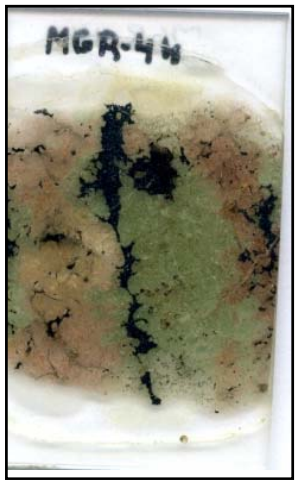




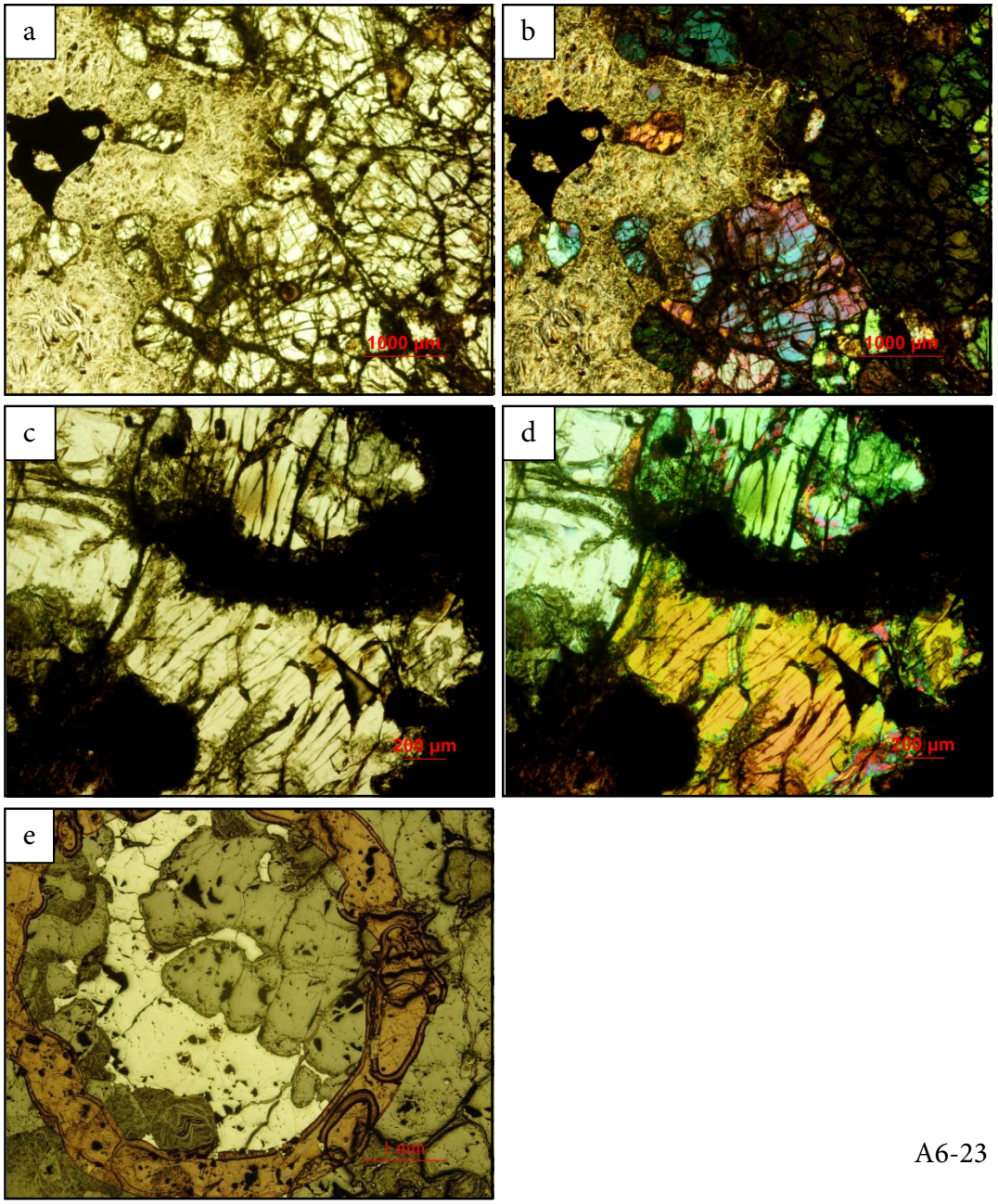
CAT-97: clinopyroxene megacryst



MGR-44: highly metasomatised xenolith

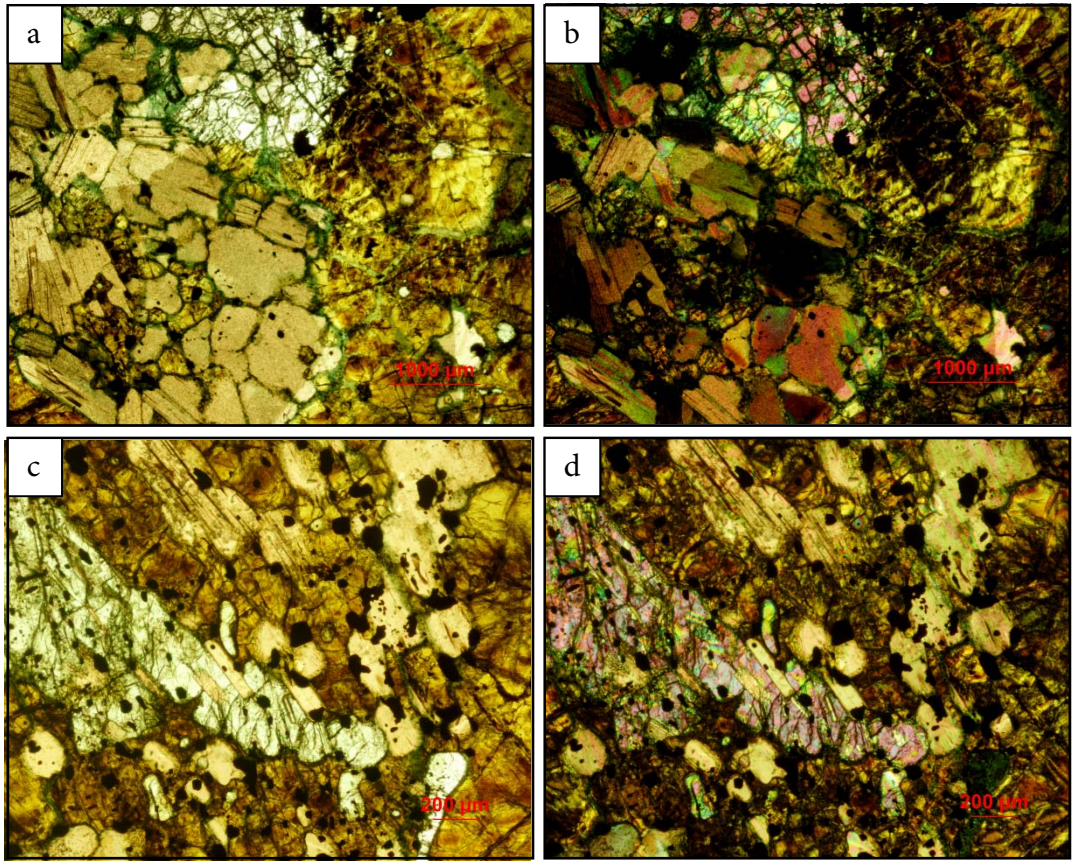


Very altered xenolith. It only preserves part of the clinopyroxene and the interstitial ilmenite. 40% of the xenolith is composed of fresh clinopyroxene grains (subhedral-euhedral, with diameters ranging from 0.5-5mm). It is in equilibrium with anhedral olivine grains, which are partially replaced by serpentine (45%) and have diameters ranging between 0.5 and 3 mm. Some crystals present inclusions, among which more than a half are now replaced by serpentine. The 15% remaining is composed of interstitial anhedral ilmenite (intergranular), which mainly appears as veinlets.

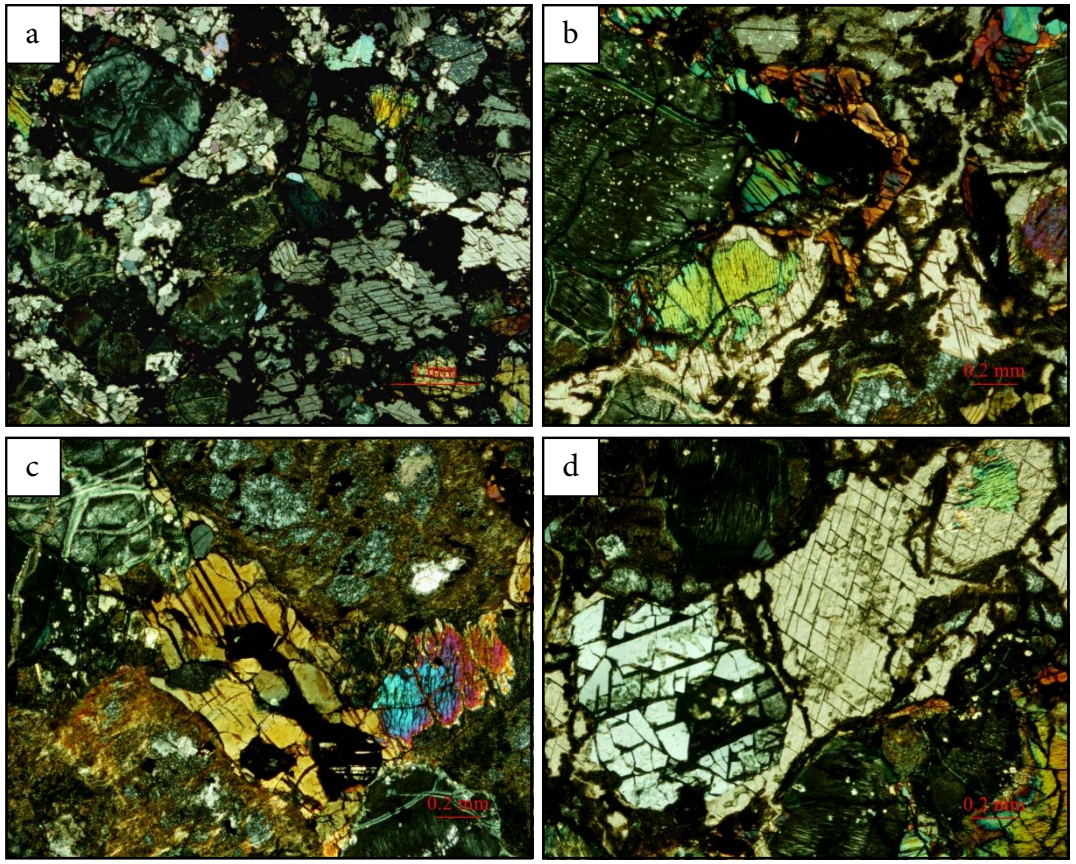


MGR-15A: highly metasomatised xenolith

Glimmerite or MARID? Xenolith mainly composed of euhedral phlogopite (0.2-1mm) crystals (35%), small grains of olivine (10%), in diameters between 0.5 and 1mm. Rounded, small clinopyroxene (5%) grains (0.5mm) and chromite (<2%) are also present. The rest of the xenolith is totally serpentinised (50%).



MGR-27: highly metasomatised xenolith

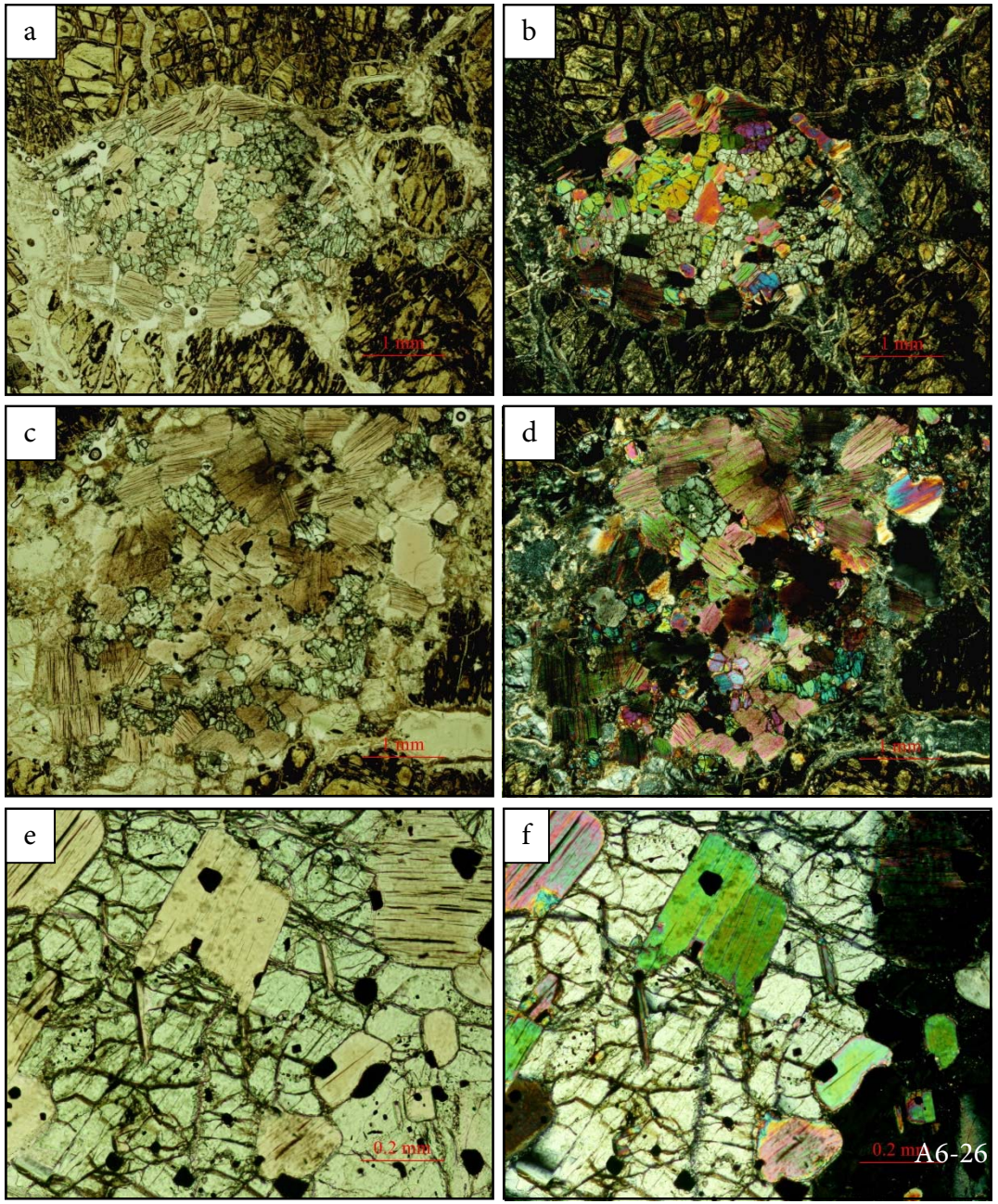


Xenolith of a highly metasomatized rock. There is interstitial carbonate, replacing the wide spaces originated by the alteration of olivine. This carbonate also replaces clinopyroxene. There are 2 types of carbonate (the 2nd one appears forming thin veins and cuts the first carbonate). As a metasomatic mineral, there is also a brown amphibole (¿kaersutite?), also interstitial and probably previous to the carbonate. It forms thin films around the olivine. There is ilmenite inside the amphibole, forming triple points, which in its turn is inside the carbonate. Calcite, in turn, is replaced by phyllosilicates. There are old olivine? crystals altered to serpentine. Inside, small crystals of high IC and forming radial aggregates were observed. also small crystals of apatite. The original rock was composed, probably, of 2 minerals: cpx and olivine with triple points between them indicating equilibrium. The alteration of the original paragenesis has been different for each mineral: the clinopyroxene probably has altered to montmorillonite (green and fine-grained). SEQUENCE: ol +px → metasomatic fluids → cal+ap+amph+ilm (Mn?) → 2nd carbonate + hematites → serpentinization + montmorillonite. It might have taken place 2 metasomatic episodes. It has also been observed chromite inside the olivine and barite (related to one of the cryptocrystalline alterations, with low IC and forming radial aggregates). Locally some green cpx have been observed (not Di-cr), with oxides inside (maybe omphacite?).

MGR-24B: highly metasomatised xenolith

MARID? Completely altered xenolith, with reddish colour. Initially it could have been formed of big olivine crystals, now totally serpentinised (70%). Among these large serpentinised olivine crystals, there are still some fresh "metasomatic nodules", which are described here. They are composed of abundant phlogopite laths (55%) and Cr-diopside grains (40%), which are now partially altered. Their maximum length ranges from 2 to 5 mm. Moreover, euhedral crystals of chromite were identified in these nodules.

There are different generations of serpentine: 1. In fractures of the olivine grains (acicular, with yellow IC and orange-yellow in NX). 2. At the boundaries of the fractures there is a second generation (always related to the first one) of acicular, greyish IC, serpentine. 3. filling the bigger fractures (intergrain?), very fine-grained and grey IC. 4. Alteration of olivine crystals (yellow). 5. Finally, there is an alteration/ replacement to/by carbonate.



A6.2. Major-element composition of olivine in mantle xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 4 oxygens.

Label	11_a_103	11_b_107	11_c_108	11_c_109	11_c_110	11_c_126	11_c_127	11_c_128	11_c_129	34_i_034	34_i_035	34_i_035	34_i_037	34_i_038	30A_c_112	30A_e_115	30A_e_116
Rock type	spl-Hz	spl-Hz	spl-Hz	spl-Hz	spl-Hz	spl-Hz	spl-Hz	spl-Hz	spl-Hz	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Lhz	grt-Lhz	grt-Lhz
Texture	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
analysed area	core	core	core	core	core	core	core	core	core	rim	core	rim	core	rim	core	core	core
SiO_2	40.78	40.69	40.72	40.56	41.21	40.01	40.54	40.09	40.76	41.02	41.05	41.30	41.37	40.69	40.27	40.42	40.08
TiO_2	0.02	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.03	0.03	0.03	0.03	0.00	0.01	0.05	0.04	0.03
Al_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.00
Cr_2O_3	0.03	0.05	0.02	0.04	0.00	0.01	0.00	0.04	0.02	0.07	0.03	0.03	0.05	0.04	0.04	0.01	0.01
FeO	7.39	7.58	7.56	7.21	7.31	7.36	7.41	7.38	7.39	7.37	7.59	7.26	7.24	7.60	8.27	7.99	8.26
MnO	0.12	0.14	0.11	0.17	0.13	0.14	0.14	0.07	0.03	0.13	0.13	0.10	0.10	0.06	0.12	0.03	0.09
MgO	51.60	51.65	51.28	51.47	51.55	51.71	51.77	51.65	51.58	51.70	51.31	51.26	51.55	51.97	52.03	51.67	52.09
CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.01	0.01	0.02	0.01
NiO	0.35	0.38	0.37	0.44	0.39	0.38	0.47	0.36	0.42	0.43	0.38	0.46	0.44	0.47	0.31	0.44	0.41
Sum Ox%	100.30	100.50	100.04	99.89	100.60	99.63	100.34	99.61	100.24	100.76	100.54	100.47	100.75	100.85	101.11	100.65	100.98
Si	0.99	0.99	0.99	0.99	0.99	0.98	0.98	0.98	0.99	0.99	0.99	1.00	1.00	0.98	0.97	0.98	0.97
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al/Al ^{IV}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al ^{VI}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.17	0.16	0.17
Mn^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	1.86	1.86	1.86	1.87	1.85	1.88	1.87	1.88	1.86	1.86	1.85	1.85	1.85	1.87	1.87	1.87	1.88
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sum Cat#	3.01	3.01	3.01	3.01	3.01	3.02	3.02	3.02	3.01	3.01	3.01	3.00	3.00	3.02	3.03	3.02	3.03
Fa	0.07	0.08	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.07	0.07	0.08	0.08	0.08	0.08
Fo	0.93	0.92	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.93	0.92	0.92	0.92	0.92

spl-Hz: spinel-harzburgite
grt-Hz: garnet-harzburgite
grt-Lhz: garnet-lherzolite
grt-Wehr: garnet-wherlite
H metasom: highly metasomatised xenolith

A6.2. Major-element composition of olivine in mantle xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 4 oxygens.

Label	30A_i_122	30A_i_123	30A_l_129	30A_l_130	30A_n_133	30A_b_106	30A_b_107	30b-h-58	30b-h-59	30b-h-60	30b-l-68	30b-l-69	30b-l-70	30b-l-77	30b-m-78	30b-m-79	30b-m-80
Rock type	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz
Texture	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
analysed area	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core
SiO_2	40.93	40.73	41.12	40.82	41.17	40.18	40.01	40.69	41.15	40.79	39.28	40.66	40.79	41.16	40.55	40.69	41.38
TiO_2	0.03	0.04	0.04	0.06	0.04	0.04	0.02	0.03	0.03	0.02	0.03	0.02	0.00	0.06	0.03	0.04	0.05
Al_2O_3	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.03	0.00	0.02
Cr_2O_3	0.04	0.04	0.03	0.05	0.06	0.01	0.03	0.02	0.02	0.07	0.02	0.01	0.02	0.01	0.06	0.05	0.04
FeO	7.89	7.96	8.18	7.85	8.03	7.50	7.75	7.69	8.13	7.84	7.58	7.77	7.84	7.91	8.18	8.13	8.25
MnO	0.10	0.12	0.11	0.04	0.08	0.08	0.06	0.13	0.03	0.10	0.11	0.08	0.09	0.10	0.05	0.11	0.06
MgO	51.80	52.03	51.72	51.40	51.72	51.64	50.97	51.90	52.11	51.74	52.15	52.16	52.03	51.87	52.33	52.06	52.11
CaO	0.00	0.00	0.00	0.01	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
NiO	0.44	0.44	0.43	0.37	0.42	0.39	0.25	0.38	0.34	0.49	0.45	0.36	0.34	0.35	0.42	0.38	0.36
Sum Ox%	101.22	101.35	101.65	100.61	101.55	99.87	99.10	100.84	101.81	101.05	99.62	101.06	101.13	101.47	101.66	101.48	102.29
Si	0.99	0.98	0.99	0.99	0.99	0.98	0.98	0.98	0.99	0.98	0.96	0.98	0.98	0.99	0.97	0.98	0.99
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al/Al ^{IV}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al ^{VI}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.17
Mn^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	1.86	1.87	1.85	1.85	1.85	1.88	1.87	1.87	1.86	1.86	1.91	1.87	1.87	1.86	1.87	1.87	1.85
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sum Cat#	3.01	3.02	3.01	3.01	3.01	3.02	3.02	3.02	3.01	3.02	3.04	3.02	3.02	3.01	3.02	3.02	3.01
Fa	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Fo	0.92	0.92	0.92	0.92	0.92	0.93	0.92	0.92	0.92	0.92	0.93	0.92	0.92	0.92	0.92	0.92	0.92

A6.2. Major-element composition of olivine in mantle xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 4 oxygens.

Label	40B_b_084	40B_d_092	40B_e_096	40B_e_097	40B_g_097	40B_g_098	40B_g_099	40B_g_100	40B_g_100	40B_g_101	31_g_092	31_g_093	31_g_094	31_g_095	31_k_106	31_k_107	31_l_108
Rock type	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz
Texture	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
analysed area	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core
SiO_2	40.59	41.23	40.10	41.01	39.29	40.16	40.05	41.50	39.29	41.25	40.75	40.73	40.71	40.87	40.58	40.80	40.61
TiO_2	0.04	0.03	0.02	0.00	0.02	0.03	0.04	0.06	0.00	0.05	0.01	0.00	0.00	0.06	0.02	0.02	0.01
Al_2O_3	0.01	0.00	0.02	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Cr_2O_3	0.02	0.01	0.05	0.05	0.06	0.04	0.06	0.04	0.02	0.04	0.05	0.00	0.01	0.00	0.03	0.07	0.03
FeO	8.69	9.16	9.02	8.78	9.19	8.95	8.71	8.90	8.93	8.74	8.85	8.74	8.83	8.96	8.91	8.82	8.66
MnO	0.08	0.09	0.11	0.09	0.17	0.07	0.16	0.16	0.15	0.15	0.10	0.15	0.08	0.05	0.08	0.13	0.09
MgO	50.93	51.22	51.62	51.18	50.64	50.81	50.82	50.44	50.71	50.81	50.69	50.77	50.49	50.38	50.65	50.34	50.59
CaO	0.03	0.00	0.01	0.02	0.02	0.02	0.01	0.04	0.03	0.03	0.02	0.01	0.01	0.01	0.02	0.00	0.00
NiO	0.40	0.41	0.40	0.48	0.36	0.43	0.36	0.36	0.49	0.39	0.46	0.40	0.40	0.39	0.39	0.40	0.37
Sum Ox%	100.81	102.15	101.34	101.67	99.74	100.52	100.22	101.50	99.62	101.46	100.92	100.80	100.55	100.73	100.69	100.58	100.37
Si	0.99	0.99	0.97	0.99	0.97	0.98	0.98	1.00	0.97	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al/Al ^{IV}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al ^{VI}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	0.18	0.18	0.18	0.18	0.19	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Mn^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	1.84	1.83	1.86	1.84	1.86	1.85	1.85	1.81	1.86	1.82	1.83	1.84	1.83	1.82	1.84	1.82	1.84
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sum Cat#	3.01	3.01	3.03	3.01	3.03	3.02	3.02	3.00	3.03	3.01	3.01	3.01	3.01	3.01	3.01	3.01	3.01
Fa	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Fo	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91

A6.2. Major-element composition of olivine in mantle xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 4 oxygens.

Label	31_l_109	31_m_112	31_m_113	40A_h_148	40A_h_149	40A_h_150	40A_l_157	40A_l_158	40A_l_159	37_d_116	37_d_117	37_d_119	37_e_016	37_g_020	37_d_014	37_d_015	10_a_092
Rock type	grt-Hz	grt-Hz	grt-Hz	Hz	Hz	Hz	Hz	Hz	Hz	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Lhz
Texture	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	sheared
grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
analysed area	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core
SiO_2	41.02	40.90	40.93	40.80	40.90	40.82	40.87	40.83	39.93	40.56	39.93	40.86	41.40	41.04	40.71	41.00	40.63
TiO_2	0.00	0.03	0.02	0.04	0.03	0.04	0.04	0.03	0.05	0.03	0.04	0.02	0.02	0.05	0.03	0.03	0.06
Al_2O_3	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr_2O_3	0.03	0.03	0.04	0.03	0.06	0.03	0.05	0.06	0.04	0.03	0.05	0.04	0.01	0.04	0.02	0.05	0.06
FeO	8.86	8.58	8.74	8.80	8.69	8.96	8.87	8.72	8.77	7.99	7.99	8.20	8.05	8.07	7.91	8.03	8.98
MnO	0.07	0.08	0.08	0.12	0.13	0.11	0.09	0.18	0.13	0.10	0.05	0.09	0.09	0.09	0.10	0.16	0.07
MgO	50.27	50.65	50.52	50.33	50.02	50.16	50.68	50.40	50.45	51.20	51.45	51.35	52.34	51.65	52.19	51.81	49.92
CaO	0.00	0.00	0.00	0.01	0.02	0.01	0.02	0.03	0.05	0.00	0.03	0.00	0.01	0.03	0.01	0.01	0.03
NiO	0.32	0.44	0.37	0.37	0.39	0.45	0.50	0.41	0.43	0.33	0.36	0.38	0.47	0.33	0.47	0.40	0.45
Sum Ox%	100.57	100.72	100.70	100.50	100.24	100.59	101.12	100.66	99.84	100.25	99.91	100.94	102.40	101.31	101.44	101.50	100.19
Si	1.00	0.99	0.99	0.99	1.00	0.99	0.99	0.99	0.98	0.99	0.98	0.99	0.99	0.99	0.98	0.99	0.99
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al/Al ^{IV}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al ^{VI}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	0.18	0.17	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.16	0.16	0.17	0.16	0.16	0.16	0.16	0.18
Mn^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	1.82	1.83	1.83	1.82	1.82	1.82	1.83	1.82	1.85	1.86	1.87	1.85	1.86	1.85	1.87	1.86	1.82
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sum Cat#	3.00	3.01	3.01	3.01	3.00	3.01	3.01	3.01	3.02	3.01	3.02	3.01	3.01	3.01	3.02	3.01	3.01
Fa	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.09
Fo	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.91

A6.2. Major-element composition of olivine in mantle xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 4 oxygens.

Label	10_a_093	10_a_094	10_b_098	10_c_102	10_c_103	10_c_104	10_e_111	10_h_124	10_h_125	10_i_132	10_i_133	10_j_138	10_b_095	10_b_096	10_b_097	10_f_115	10_f_116
Rock type	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz
Texture	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared
grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	fine	fine	fine	fine	fine
analysed area	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core
SiO_2	40.63	40.87	40.92	40.42	40.98	40.51	40.50	40.95	40.79	41.15	40.25	40.59	40.72	40.97	40.31	40.58	40.20
TiO_2	0.04	0.05	0.05	0.04	0.01	0.05	0.04	0.05	0.02	0.03	0.04	0.04	0.05	0.03	0.03	0.02	0.05
Al_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.04	0.01	0.00	0.03	0.01	0.01	0.03	0.00
Cr_2O_3	0.06	0.05	0.07	0.04	0.03	0.04	0.07	0.07	0.05	0.04	0.06	0.04	0.02	0.03	0.04	0.03	0.05
FeO	8.85	8.40	8.62	8.40	8.71	8.76	8.64	8.90	8.58	8.57	8.81	8.57	8.88	8.46	8.85	8.74	8.81
MnO	0.11	0.14	0.12	0.05	0.03	0.09	0.09	0.13	0.17	0.14	0.11	0.12	0.17	0.11	0.13	0.09	0.13
MgO	50.15	49.76	50.19	49.66	49.61	49.89	50.33	49.59	49.56	49.81	50.25	49.85	50.07	49.99	50.46	49.97	49.89
CaO	0.02	0.05	0.05	0.05	0.04	0.07	0.03	0.06	0.06	0.06	0.03	0.07	0.02	0.04	0.05	0.05	0.05
NiO	0.34	0.40	0.32	0.42	0.40	0.44	0.49	0.42	0.39	0.37	0.46	0.39	0.39	0.44	0.43	0.43	0.43
Sum Ox%	100.20	99.73	100.33	99.08	99.81	99.85	100.20	100.20	99.62	100.21	100.02	99.67	100.35	100.08	100.29	99.93	99.59
Si	0.99	1.00	1.00	1.00	1.00	0.99	0.99	1.00	1.00	1.00	0.99	1.00	0.99	1.00	0.98	0.99	0.99
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al/Al ^{IV}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al ^{VI}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	0.18	0.17	0.18	0.17	0.18	0.18	0.18	0.18	0.18	0.17	0.18	0.18	0.18	0.17	0.18	0.18	0.18
Mn^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	1.82	1.81	1.82	1.82	1.81	1.82	1.83	1.80	1.81	1.81	1.83	1.82	1.82	1.82	1.84	1.82	1.83
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sum Cat#	3.01	3.00	3.00	3.00	3.00	3.01	3.01	3.00	3.00	3.00	3.01	3.00	3.01	3.00	3.02	3.01	3.01
Fa	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Fo	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91

A6.2. Major-element composition of olivine in mantle xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 4 oxygens.

Label	10_g_021	10_g_022	10_g_023	28_c_080	28_c_41	28_c_42	28_c_43	28_d_44	28_d_45	28_h_085	28_j_062	28_j_063	28_k_067	28_k_068	28_k_086	28_l_106	28_l_107
Rock type	grt-Lhz	grt-Lhz	grt-Lhz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz
Texture	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared
grain size	coarse	coarse	coarse	coarse	coarse	coarse	medium	medium	coarse	coarse	medium	medium	medium	medium	coarse	fine	fine
analysed area	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core
SiO_2	41.18	41.66	41.14	39.73	40.68	40.70	40.65	40.95	41.02	40.15	41.13	40.55	40.37	40.34	39.33	41.38	40.86
TiO_2	0.04	0.02	0.02	0.03	0.05	0.02	0.04	0.05	0.05	0.05	0.05	0.04	0.04	0.00	0.04	0.02	0.06
Al_2O_3	0.03	0.00	0.02	0.01	0.00	0.01	0.00	0.05	0.00	0.00	0.00	0.00	0.04	0.01	0.01	0.00	0.00
Cr_2O_3	0.04	0.05	0.04	0.06	0.05	0.09	0.06	0.07	0.09	0.07	0.08	0.05	0.06	0.08	0.07	0.09	0.12
FeO	8.64	8.90	8.91	8.64	8.67	9.05	8.60	8.74	8.60	8.93	8.84	8.90	8.97	9.09	8.95	8.72	8.89
MnO	0.10	0.17	0.09	0.15	0.17	0.13	0.05	0.13	0.08	0.10	0.12	0.12	0.09	0.13	0.08	0.07	0.10
MgO	49.67	50.13	50.26	50.23	50.78	50.85	50.20	49.89	50.11	49.80	50.08	50.41	50.37	50.30	50.43	49.43	49.70
CaO	0.05	0.07	0.05	0.04	0.03	0.03	0.06	0.02	0.04	0.07	0.04	0.05	0.07	0.06	0.06	0.07	0.05
NiO	0.41	0.40	0.44	0.41	0.40	0.50	0.47	0.43	0.44	0.38	0.34	0.38	0.42	0.45	0.41	0.36	0.44
Sum Ox%	100.17	101.41	100.96	99.29	100.84	101.39	100.14	100.33	100.44	99.56	100.68	100.51	100.41	100.46	99.37	100.15	100.22
Si	1.00	1.00	1.00	0.98	0.99	0.98	0.99	1.00	1.00	0.99	1.00	0.99	0.99	0.99	0.97	1.01	1.00
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al/Al ^{IV}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al ^{VI}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.19	0.19	0.18	0.18
Mn^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	1.80	1.80	1.81	1.85	1.84	1.83	1.83	1.81	1.82	1.83	1.81	1.83	1.83	1.83	1.86	1.79	1.81
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sum Cat#	3.00	3.00	3.00	3.02	3.01	3.02	3.01	3.00	3.00	3.01	3.00	3.01	3.01	3.02	3.03	2.99	3.00
Fa	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Fo	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91

A6.2. Major-element composition of olivine in mantle xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 4 oxygens.

Label	28_l_108	28_c_078	28_c_079	28_j_064	28_j_065	28_j_066	24A_a_6	24A_a_6	24A_b-11	24A_b-12	24A_b-13	24A_f_102c	24A_f_104c	24A_f-21	24A_f-22	24A_f-23	24A_f-24
Rock type	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz
Texture	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared
grain size	fine	coarse	coarse	fine	fine	fine	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
analysed area	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core
SiO_2	40.89	39.72	40.00	39.92	40.58	40.69	39.72	40.42	40.03	39.70	39.34	39.34	39.98	39.92	40.30	40.04	39.91
TiO_2	0.01	0.06	0.04	0.03	0.01	0.03	0.01	0.00	0.03	0.00	0.01	0.03	0.02	0.01	0.02	0.02	0.01
Al_2O_3	0.03	0.00	0.01	0.02	0.03	0.02	0.00	0.02	0.01	0.00	0.02	0.00	0.01	0.03	0.00	0.00	0.00
Cr_2O_3	0.07	0.09	0.10	0.07	0.11	0.07	0.06	0.06	0.05	0.08	0.09	0.08	0.08	0.05	0.09	0.08	0.11
FeO	8.67	8.88	8.84	8.74	8.55	8.79	8.46	8.64	8.22	8.28	8.47	8.37	8.23	8.43	8.31	8.57	8.74
MnO	0.07	0.10	0.03	0.10	0.13	0.11	0.04	0.11	0.12	0.12	0.12	0.12	0.04	0.12	0.13	0.12	0.15
MgO	49.42	50.43	50.30	50.52	49.98	50.25	50.77	50.85	50.50	50.89	51.34	50.75	50.66	51.22	51.32	51.31	51.49
CaO	0.06	0.03	0.06	0.06	0.07	0.04	0.05	0.07	0.08	0.05	0.05	0.05	0.07	0.03	0.05	0.06	0.05
NiO	0.39	0.36	0.53	0.50	0.44	0.41	0.49	0.39	0.51	0.41	0.32	0.32	0.39	0.49	0.47	0.44	0.42
Sum Ox%	99.61	99.68	99.91	99.94	99.90	100.41	99.61	100.56	99.54	99.53	99.77	99.07	99.48	100.30	100.70	100.63	100.87
Si	1.00	0.98	0.98	0.98	0.99	0.99	0.98	0.98	0.98	0.98	0.97	0.97	0.98	0.97	0.98	0.98	0.97
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al/Al ^{IV}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al ^{VI}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	0.18	0.18	0.18	0.18	0.18	0.18	0.17	0.18	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.18
Mn^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	1.80	1.85	1.84	1.85	1.82	1.82	1.86	1.84	1.85	1.86	1.88	1.87	1.85	1.86	1.86	1.86	1.87
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sum Cat#	3.00	3.02	3.02	3.02	3.01	3.01	3.02	3.02	3.02	3.02	3.03	3.03	3.02	3.03	3.02	3.02	3.03
Fa	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.08	0.09	0.09	0.08	0.08	0.08	0.09	0.09
Fo	0.91	0.91	0.91	0.91	0.91	0.91	0.92	0.91	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.91	0.91

A6.2. Major-element composition of olivine in mantle xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 4 oxygens.

Label	12_d-136	12_d-137	12_d-138	12_j-149	12_j-150	12_j_100	12_f_092	32A_a_069	32A_a_070	32A_a_071	32A_d_081	32A_d_082	32B_c_044	32B_c_045	32B_e_053	32B_e_054	32B_e_055
Rock type	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz
Texture	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared
grain size	coarse	coarse	coarse	coarse	coarse	coarse	fine	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
analysed area	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core
SiO_2	39.91	39.97	40.48	39.50	38.25	41.49	40.63	40.43	40.55	40.71	40.17	39.81	39.77	39.83	40.74	39.87	39.73
TiO_2	0.00	0.04	0.04	0.05	0.01	0.06	0.00	0.03	0.01	0.02	0.03	0.02	0.03	0.00	0.00	0.04	0.04
Al_2O_3	0.00	0.04	0.02	0.01	0.00	0.02	0.00	0.06	0.02	0.00	0.00	0.01	0.01	0.02	0.02	0.00	0.01
Cr_2O_3	0.07	0.09	0.06	0.07	0.10	0.05	0.09	0.12	0.08	0.06	0.10	0.08	0.08	0.07	0.08	0.08	0.12
FeO	8.57	8.28	8.66	8.35	8.41	8.17	8.01	8.59	8.94	8.72	10.37	10.49	8.72	8.58	8.82	8.81	8.70
MnO	0.07	0.24	0.13	0.11	0.14	0.09	0.12	0.16	0.11	0.07	0.12	0.13	0.11	0.11	0.12	0.11	0.15
MgO	50.69	51.15	51.32	51.25	50.91	49.48	49.35	50.16	50.17	50.15	49.26	49.37	50.90	50.79	50.70	51.04	50.93
CaO	0.05	0.05	0.04	0.05	0.05	0.06	0.06	0.04	0.04	0.04	0.04	0.06	0.04	0.07	0.05	0.06	0.03
NiO	0.35	0.41	0.45	0.32	0.42	0.41	0.36	0.41	0.39	0.40	0.31	0.37	0.41	0.45	0.47	0.40	0.52
Sum Ox%	99.72	100.26	101.20	99.72	98.30	99.82	98.62	100.01	100.31	100.17	100.40	100.34	100.08	99.93	101.01	100.43	100.23
Si	0.98	0.98	0.98	0.97	0.96	1.01	1.00	0.99	0.99	0.99	0.99	0.98	0.97	0.98	0.99	0.97	0.97
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al/Al ^{IV}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al ^{VI}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	0.18	0.17	0.18	0.17	0.18	0.17	0.17	0.18	0.18	0.18	0.21	0.22	0.18	0.18	0.18	0.18	0.18
Mn^{2+}	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	1.85	1.86	1.85	1.88	1.90	1.80	1.82	1.83	1.83	1.82	1.80	1.81	1.86	1.86	1.83	1.86	1.86
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sum Cat#	3.02	3.02	3.02	3.03	3.04	2.99	3.00	3.01	3.01	3.01	3.01	3.02	3.02	3.02	3.01	3.03	3.03
Fa	0.09	0.08	0.09	0.08	0.09	0.09	0.08	0.09	0.09	0.09	0.11	0.11	0.09	0.09	0.09	0.09	0.09
Fo	0.91	0.92	0.91	0.92	0.92	0.92	0.92	0.91	0.91	0.91	0.89	0.89	0.91	0.91	0.91	0.91	0.91

A6.2. Major-element composition of olivine in mantle xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 4 oxygens.

Label	32B_g_062	32B_h_063	32B_h_064	32B_h_065	32B_c_043	32B_d_048	32B_d_049	32B_g_049	32B_g_050	32B_g_051	15A-j-101	15A-j-102	15A-j-103
Rock type	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	H metasom.	H metasom.	H metasom.
Texture	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	coarse	coarse	coarse
grain size	coarse	coarse	coarse	coarse	coarse	fine	fine	fine	fine	coarse	coarse	coarse	coarse
analysed area	core	core	core	core	core	core	core	core	core	core	core	core	core
SiO_2	39.95	39.72	40.06	39.41	39.82	40.11	40.02	41.29	41.45	41.07	39.59	39.34	39.51
TiO_2	0.03	0.01	0.03	0.02	0.05	0.03	0.07	0.04	0.01	0.05	0.01	0.02	0.00
Al_2O_3	0.06	0.00	0.00	0.00	0.00	0.03	0.03	0.02	0.03	0.00	0.00	0.00	0.00
Cr_2O_3	0.09	0.07	0.08	0.08	0.11	0.09	0.09	0.10	0.12	0.08	0.03	0.04	0.05
FeO	8.72	8.84	8.79	8.51	8.85	8.46	8.42	8.46	8.47	8.44	14.11	14.06	14.29
MnO	0.08	0.19	0.06	0.11	0.19	0.17	0.17	0.10	0.11	0.15	0.11	0.16	0.21
MgO	50.74	51.01	51.18	51.27	51.36	50.95	51.00	50.21	50.30	50.08	46.61	46.69	46.84
CaO	0.10	0.05	0.04	0.05	0.07	0.08	0.06	0.07	0.05	0.08	0.02	0.00	0.02
NiO	0.38	0.44	0.38	0.43	0.41	0.41	0.38	0.31	0.34	0.48	0.26	0.33	0.19
Sum Ox%	100.15	100.32	100.63	99.88	100.85	100.32	100.24	100.60	100.88	100.43	100.73	100.64	101.11
Si	0.98	0.97	0.98	0.97	0.97	0.98	0.98	1.00	1.00	1.00	0.99	0.98	0.98
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al/Al ^{IV}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al ^{VI}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	0.18	0.18	0.18	0.18	0.18	0.17	0.17	0.17	0.17	0.17	0.29	0.29	0.30
Mn^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	1.85	1.86	1.86	1.88	1.86	1.85	1.86	1.81	1.81	1.81	1.73	1.73	1.73
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ni	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
Sum Cat#	3.02	3.03	3.02	3.03	3.03	3.02	3.02	3.00	3.00	3.00	3.02	3.02	3.02
Fa	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.15	0.15	0.15
Fo	0.91	0.91	0.91	0.92	0.91	0.92	0.92	0.91	0.91	0.91	0.86	0.86	0.85

A6.2. Major-element composition of orthopyroxene in the xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 6 oxygens.

Label	10_a_015	10_b_099	10_b_100	10_b_101	10_e_108	10_e_109	10_e_110	10_f_112	10_f_113	10_f_114	10_i_126	10_i_127	10_i_128	11_a_100	11_a_101	11_a_102
Rock type	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	spl-Hz	spl-Hz	spl-Hz
Rock microstr.	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	coarse	coarse	coarse
Grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
SiO_2	57.91	57.92	57.68	57.21	57.91	57.74	57.86	56.95	57.69	57.24	57.69	57.95	57.75	57.47	55.58	55.89
TiO_2	0.17	0.16	0.14	0.20	0.17	0.18	0.18	0.17	0.22	0.15	0.18	0.21	0.16	0.00	0.02	0.01
Al_2O_3	0.65	0.67	0.68	0.72	0.64	0.67	0.72	0.67	0.68	0.76	0.69	0.62	0.69	1.65	2.39	2.00
Cr_2O_3	0.43	0.28	0.31	0.29	0.28	0.29	0.28	0.31	0.26	0.27	0.30	0.31	0.30	0.26	0.45	0.28
Fe_2O_3	1.19	0.00	0.85	0.79	0.03	0.00	0.03	1.30	0.21	1.72	0.00	0.00	0.31	1.78	3.08	2.87
FeO(c)	4.31	5.12	4.31	4.48	5.17	4.96	5.25	3.87	5.09	3.82	5.10	5.27	4.87	3.98	2.62	2.69
MnO	0.14	0.10	0.22	0.15	0.10	0.12	0.15	0.13	0.13	0.12	0.16	0.13	0.12	0.15	0.17	0.15
MgO	35.23	34.72	35.01	34.75	34.81	34.64	34.68	34.87	34.76	35.16	34.69	34.61	34.80	36.08	35.43	35.71
CaO	0.87	0.82	0.81	0.82	0.85	0.85	0.85	0.85	0.81	0.83	0.84	0.84	0.90	0.15	0.37	0.27
Na_2O	0.22	0.22	0.24	0.21	0.21	0.27	0.23	0.22	0.21	0.20	0.20	0.20	0.22	0.01	0.02	0.00
K_2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.01
Sum Ox%	101.13	100.02	100.25	99.62	100.16	99.72	100.23	99.33	100.06	100.26	99.84	100.13	100.11	101.55	100.13	99.89
Si	1.969	1.988	1.976	1.973	1.986	1.987	1.984	1.968	1.981	1.962	1.984	1.988	1.981	1.942	1.906	1.918
Ti	0.004	0.004	0.004	0.005	0.004	0.005	0.005	0.004	0.006	0.004	0.005	0.005	0.004	0.000	0.001	0.000
Al/Al IV	0.026	0.012	0.024	0.027	0.014	0.013	0.016	0.027	0.019	0.031	0.016	0.012	0.019	0.058	0.094	0.081
Al VI	0.000	0.015	0.003	0.002	0.011	0.015	0.013	0.000	0.009	0.000	0.012	0.013	0.009	0.007	0.002	0.000
Cr	0.012	0.007	0.008	0.008	0.008	0.008	0.008	0.008	0.007	0.007	0.008	0.009	0.008	0.007	0.012	0.008
Fe^{3+}	0.030	0.000	0.022	0.020	0.001	0.000	0.001	0.034	0.005	0.044	0.000	0.000	0.008	0.045	0.080	0.074
Fe^{2+}	0.123	0.147	0.123	0.129	0.148	0.143	0.151	0.112	0.146	0.109	0.147	0.151	0.140	0.112	0.075	0.077
Mn^{2+}	0.004	0.003	0.006	0.004	0.003	0.004	0.004	0.004	0.004	0.004	0.005	0.004	0.003	0.004	0.005	0.004
Mg	1.785	1.776	1.787	1.786	1.779	1.777	1.772	1.796	1.779	1.796	1.779	1.770	1.780	1.817	1.811	1.827
Ca	0.032	0.030	0.030	0.030	0.031	0.031	0.031	0.031	0.030	0.030	0.031	0.031	0.033	0.005	0.013	0.010
Na	0.015	0.015	0.016	0.014	0.014	0.018	0.015	0.015	0.014	0.013	0.013	0.013	0.015	0.000	0.001	0.000
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
Sum Cat#	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Wo(Ca)	1.6	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.5	1.6	1.6	1.6	1.7	0.3	0.7	0.5
En(Mg)	92.0	90.9	92.1	91.8	90.8	91.1	90.7	92.6	91.0	92.8	90.9	90.7	91.2	93.9	95.3	95.5
Fs(Fe^{2+})	6.3	7.5	6.4	6.6	7.6	7.3	7.7	5.8	7.5	5.7	7.5	7.7	7.2	5.8	4.0	4.0
XMg	0.936	0.924	0.935	0.933	0.923	0.926	0.922	0.941	0.924	0.943	0.924	0.921	0.927	0.942	0.960	0.960

A6.2. Major-element composition of orthopyroxene in the xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 6 oxygens.

Label	11_a_122	11_a_123	11_a_124	11_a_125	11_b_104	11_b_105	11_b_106	12-b-118	12-b-119	12-c-133	12-c-134	12-c-135	12-e-141	12-i-145	12-i-146	12-i-147
Rock type	spl-Hz	spl-Hz	spl-Hz	spl-Hz	spl-Hz	spl-Hz	spl-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz
Rock microstr.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared
Grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
SiO_2	53.57	54.34	55.02	54.18	55.58	56.92	56.10	55.48	52.68	55.56	56.67	56.06	56.15	56.87	57.06	56.05
TiO_2	0.00	0.02	0.00	0.02	0.00	0.01	0.02	0.15	0.15	0.15	0.13	0.17	0.20	0.16	0.18	0.15
Al_2O_3	2.00	2.42	1.76	1.53	2.31	2.35	2.88	0.68	0.71	0.65	0.68	0.65	0.70	0.75	0.71	0.71
Cr_2O_3	0.38	0.43	0.25	0.16	0.48	0.40	0.55	0.44	0.40	0.45	0.45	0.44	0.46	0.49	0.44	0.46
Fe_2O_3	5.97	5.00	4.94	5.88	3.40	0.00	1.26	2.09	4.99	4.18	3.05	2.91	3.95	3.05	2.32	4.36
FeO(c)	0.00	1.00	0.86	0.21	2.31	5.12	4.07	2.43	0.00	1.08	2.03	2.00	1.58	2.37	2.79	1.12
MnO	0.17	0.13	0.18	0.17	0.14	0.14	0.13	0.11	0.10	0.13	0.13	0.13	0.12	0.09	0.15	0.15
MgO	36.08	34.73	36.08	35.97	35.05	34.78	34.62	34.64	34.92	35.37	35.52	35.22	35.49	35.52	35.28	35.46
CaO	0.11	1.01	0.23	0.16	0.71	0.25	0.67	0.93	0.84	0.91	0.93	0.91	0.95	0.99	0.99	0.93
Na_2O	0.05	0.14	0.02	0.02	0.14	0.04	0.07	0.22	0.30	0.25	0.26	0.24	0.25	0.24	0.28	0.31
K_2O	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02
Sum Ox%	98.32	99.22	99.36	98.3	100.13	100.02	100.38	97.16	95.08	98.75	99.84	98.73	99.84	100.53	100.19	99.73
Si	1.869	1.884	1.898	1.889	1.907	1.951	1.920	1.956	1.901	1.930	1.946	1.946	1.932	1.943	1.954	1.930
Ti	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.004	0.004	0.004	0.003	0.004	0.005	0.004	0.005	0.004
Al/Al IV	0.082	0.099	0.072	0.063	0.093	0.049	0.080	0.028	0.030	0.027	0.027	0.027	0.028	0.030	0.029	0.029
Al VI	0.000	0.000	0.000	0.000	0.001	0.046	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cr	0.011	0.012	0.007	0.005	0.013	0.011	0.015	0.012	0.011	0.012	0.012	0.012	0.013	0.013	0.012	0.013
Fe^{3+}	0.157	0.130	0.128	0.154	0.088	0.000	0.032	0.055	0.136	0.109	0.079	0.076	0.102	0.078	0.060	0.113
Fe^{2+}	0.000	0.029	0.025	0.006	0.066	0.147	0.116	0.071	0.000	0.031	0.058	0.058	0.045	0.068	0.080	0.032
Mn^{2+}	0.005	0.004	0.005	0.005	0.004	0.004	0.004	0.003	0.003	0.004	0.004	0.004	0.003	0.003	0.004	0.004
Mg	1.876	1.795	1.855	1.870	1.792	1.777	1.766	1.820	1.878	1.831	1.818	1.823	1.820	1.809	1.801	1.820
Ca	0.004	0.037	0.009	0.006	0.026	0.009	0.025	0.035	0.032	0.034	0.034	0.034	0.035	0.036	0.036	0.034
Na	0.003	0.010	0.002	0.001	0.009	0.003	0.005	0.015	0.021	0.017	0.018	0.016	0.017	0.016	0.019	0.020
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Sum Cat#	4.01	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.02	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Wo(Ca)	0.2	2.0	0.5	0.3	1.4	0.5	1.3	1.8	1.7	1.8	1.8	1.8	1.8	1.9	1.9	1.8
En(Mg)	99.8	96.4	98.2	99.4	95.1	91.9	92.6	94.5	98.3	96.5	95.2	95.2	95.8	94.6	93.9	96.5
Fs(Fe^{2+})	0.0	1.6	1.3	0.3	3.5	7.6	6.1	3.7	0.0	1.7	3.0	3.0	2.4	3.5	4.2	1.7
XMg	1.000	0.984	0.987	0.997	0.964	0.924	0.938	0.962	1.000	0.983	0.969	0.969	0.976	0.964	0.958	0.983

A6.2. Major-element composition of orthopyroxene in the xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 6 oxygens.

Label	12-i-148	24a-a-4	24a-a-5	24a-c-14	24a-c-15	24a-c-16	24a-g-25	24a-g-26	24a-g-27	28_a_033	28_a_034	28_a_072	28_a_073b	28_a_074b	28_a_36	28_a_37
Rock type	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz
Rock microstr.	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared
Grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
SiO_2	56.08	56.53	57.69	57.34	57.51	57.82	57.23	56.90	57.36	57.62	57.26	57.09	56.45	56.07	58.33	58.03
TiO_2	0.15	0.03	0.07	0.07	0.08	0.03	0.04	0.08	0.04	0.17	0.22	0.19	0.14	0.15	0.16	0.18
Al_2O_3	0.69	0.59	0.56	0.61	0.55	0.62	0.56	0.63	0.62	0.69	0.68	0.70	0.70	0.70	0.70	0.67
Cr_2O_3	0.42	0.42	0.44	0.40	0.43	0.38	0.41	0.49	0.42	0.45	0.44	0.47	0.42	0.42	0.42	0.46
Fe_2O_3	4.18	2.28	1.52	1.64	2.80	1.79	1.37	3.09	2.44	0.96	1.07	1.36	2.26	3.39	0.03	0.31
FeO(c)	1.61	2.90	3.84	3.70	2.86	3.30	3.73	2.16	2.92	4.34	4.34	4.05	3.34	2.07	5.30	5.06
MnO	0.07	0.13	0.12	0.11	0.09	0.16	0.13	0.16	0.23	0.11	0.12	0.17	0.13	0.10	0.10	0.10
MgO	35.46	35.12	35.40	35.33	35.85	35.82	35.23	35.72	35.62	34.86	34.69	34.68	34.64	35.10	34.84	34.75
CaO	0.98	1.00	1.01	0.93	0.98	1.00	1.00	0.99	0.99	1.02	1.02	1.04	1.01	0.98	0.99	0.94
Na_2O	0.23	0.16	0.15	0.14	0.16	0.13	0.11	0.18	0.15	0.25	0.23	0.23	0.24	0.26	0.25	0.27
K_2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum Ox%	99.87	99.16	100.82	100.28	101.31	101.06	99.83	100.41	100.79	100.46	100.07	99.97	99.34	99.26	101.12	100.76
Si	1.930	1.957	1.966	1.964	1.951	1.963	1.968	1.945	1.955	1.972	1.968	1.965	1.955	1.940	1.984	1.981
Ti	0.004	0.001	0.002	0.002	0.002	0.001	0.001	0.002	0.001	0.004	0.006	0.005	0.004	0.004	0.004	0.005
Al/Al IV	0.028	0.024	0.023	0.025	0.022	0.025	0.023	0.025	0.025	0.028	0.028	0.028	0.028	0.029	0.016	0.019
Al VI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.008
Cr	0.012	0.011	0.012	0.011	0.011	0.010	0.011	0.013	0.011	0.012	0.012	0.013	0.011	0.012	0.011	0.012
Fe^{3+}	0.108	0.059	0.039	0.042	0.072	0.046	0.035	0.080	0.063	0.025	0.028	0.035	0.059	0.088	0.001	0.008
Fe^{2+}	0.046	0.084	0.109	0.106	0.081	0.094	0.107	0.062	0.083	0.124	0.125	0.116	0.097	0.060	0.151	0.144
Mn^{2+}	0.002	0.004	0.004	0.003	0.003	0.005	0.004	0.005	0.007	0.003	0.003	0.005	0.004	0.003	0.003	0.003
Mg	1.819	1.812	1.799	1.803	1.812	1.812	1.806	1.820	1.809	1.778	1.778	1.779	1.788	1.810	1.766	1.768
Ca	0.036	0.037	0.037	0.034	0.036	0.036	0.037	0.036	0.036	0.037	0.038	0.038	0.037	0.036	0.036	0.035
Na	0.015	0.010	0.010	0.009	0.010	0.008	0.008	0.012	0.010	0.017	0.015	0.015	0.016	0.017	0.016	0.018
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sum Cat#	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Wo(Ca)	1.9	1.9	1.9	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.8	1.8
En(Mg)	95.7	93.7	92.5	92.8	93.9	93.3	92.6	94.9	93.8	91.7	91.6	92.0	93.0	94.9	90.4	90.8
Fs(Fe^{2+})	2.4	4.3	5.6	5.5	4.2	4.8	5.5	3.2	4.3	6.4	6.4	6.0	5.0	3.1	7.7	7.4
XMg	0.975	0.956	0.943	0.945	0.957	0.951	0.944	0.967	0.956	0.935	0.934	0.939	0.949	0.968	0.921	0.924

A6.2. Major-element composition of orthopyroxene in the xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 6 oxygens.

Label	28_d_46	28_d_47	28_g_056	28_g_057	28_g_081	28_g_082	28_i_060	28_i_061	28_l_114	28_l_115	28_l_116	30A_c_110	30A_c_111	30b-c-34	30b-c-35	30b-c-36
Rock type	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz
Rock microstr.	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	coarse	coarse	coarse	coarse	coarse
Grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	neoblast	neoblast	neoblast	coarse	coarse	coarse	coarse	coarse
SiO_2	57.55	58.02	57.98	58.02	56.57	56.68	57.63	57.34	58.37	58.02	57.64	57.22	57.82	54.74	57.60	57.96
TiO_2	0.16	0.15	0.18	0.15	0.17	0.14	0.15	0.17	0.16	0.18	0.19	0.09	0.08	0.09	0.07	0.04
Al_2O_3	0.68	0.69	0.70	0.76	0.72	0.69	0.69	0.70	0.70	0.66	0.73	0.40	0.43	0.43	0.50	0.47
Cr_2O_3	0.45	0.44	0.46	0.47	0.46	0.49	0.46	0.43	0.42	0.42	0.48	0.15	0.16	0.42	0.27	0.23
Fe_2O_3	1.27	0.37	0.00	0.17	2.84	2.44	1.42	1.02	0.00	0.00	0.50	2.94	3.05	5.43	1.18	1.47
FeO(c)	4.07	5.04	5.08	4.88	2.64	3.11	4.02	4.23	5.41	5.15	4.77	2.30	2.17	0.00	3.45	3.36
MnO	0.09	0.11	0.10	0.14	0.14	0.08	0.06	0.10	0.14	0.18	0.07	0.13	0.10	0.06	0.12	0.11
MgO	35.02	34.70	34.67	34.82	35.14	34.92	35.11	34.81	34.58	34.07	34.66	36.63	37.12	37.80	36.32	36.59
CaO	0.99	1.02	0.99	1.01	0.99	0.96	0.94	0.92	1.05	1.10	1.28	0.27	0.30	0.65	0.24	0.27
Na_2O	0.24	0.26	0.23	0.24	0.24	0.27	0.26	0.25	0.23	0.26	0.17	0.10	0.08	0.21	0.07	0.07
K_2O	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.00
Sum Ox%	100.51	100.81	100.4	100.68	99.91	99.78	100.74	99.98	101.05	100.04	100.52	100.23	101.32	99.83	99.82	100.58
Si	1.968	1.980	1.984	1.980	1.946	1.953	1.966	1.971	1.987	1.993	1.973	1.953	1.951	1.884	1.972	1.970
Ti	0.004	0.004	0.005	0.004	0.004	0.004	0.004	0.005	0.004	0.005	0.005	0.002	0.002	0.002	0.002	0.001
Al/Al IV	0.027	0.020	0.016	0.020	0.029	0.028	0.028	0.028	0.013	0.007	0.027	0.016	0.017	0.017	0.020	0.019
Al VI	0.000	0.008	0.012	0.011	0.000	0.000	0.000	0.000	0.015	0.020	0.003	0.000	0.000	0.000	0.000	0.000
Cr	0.012	0.012	0.013	0.013	0.013	0.013	0.013	0.012	0.011	0.011	0.013	0.004	0.004	0.011	0.007	0.006
Fe^{3+}	0.033	0.009	0.000	0.004	0.074	0.063	0.036	0.026	0.000	0.000	0.013	0.075	0.077	0.141	0.030	0.038
Fe^{2+}	0.116	0.144	0.145	0.139	0.076	0.090	0.115	0.122	0.154	0.148	0.136	0.066	0.061	0.000	0.099	0.095
Mn^{2+}	0.003	0.003	0.003	0.004	0.004	0.002	0.002	0.003	0.004	0.005	0.002	0.004	0.003	0.002	0.003	0.003
Mg	1.785	1.765	1.768	1.772	1.802	1.793	1.785	1.783	1.755	1.745	1.769	1.863	1.867	1.940	1.853	1.853
Ca	0.036	0.037	0.036	0.037	0.036	0.035	0.034	0.034	0.038	0.041	0.047	0.010	0.011	0.024	0.009	0.010
Na	0.016	0.017	0.016	0.016	0.016	0.018	0.017	0.017	0.015	0.017	0.011	0.006	0.005	0.014	0.005	0.004
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
Sum Cat#	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.99	4.00	4.00	4.00	4.04	4.00	4.00
Wo(Ca)	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	2.0	2.1	2.4	0.5	0.6	1.2	0.4	0.5
En(Mg)	92.1	90.7	90.7	91.0	94.1	93.5	92.3	92.0	90.1	90.2	90.6	96.1	96.3	98.8	94.5	94.6
Fs(Fe^{2+})	6.0	7.4	7.5	7.2	4.0	4.7	5.9	6.3	7.9	7.7	7.0	3.4	3.2	0.0	5.0	4.9
XMg	0.939	0.925	0.924	0.927	0.960	0.952	0.940	0.936	0.919	0.922	0.928	0.966	0.968	1.000	0.949	0.951

A6.2. Major-element composition of orthopyroxene in the xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 6 oxygens.

Label	30b-c-37	30b-d-47	30b-d-48	30b-d-49	30b-h-54	30b-h-55	30b-h-56	30b-h-57	31_h_096	31_h_097	31_h_098	31_h_099	31_l_110	31_l_111	32B_c_046	32B_c_047
Rock type	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz
Rock microstr.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	sheared	sheared
Grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
SiO_2	57.95	58.42	57.78	58.37	58.52	57.80	57.65	58.04	57.49	57.77	57.85	58.14	57.84	58.08	56.75	56.83
TiO_2	0.07	0.09	0.02	0.08	0.06	0.08	0.07	0.09	0.02	0.02	0.02	0.04	0.02	0.02	0.16	0.17
Al_2O_3	0.48	0.50	0.40	0.42	0.46	0.46	0.43	0.47	0.40	0.44	0.43	0.44	0.45	0.43	0.68	0.70
Cr_2O_3	0.29	0.30	0.21	0.26	0.27	0.25	0.30	0.26	0.24	0.27	0.24	0.27	0.24	0.21	0.46	0.51
Fe_2O_3	0.96	1.12	2.43	1.60	1.93	2.95	2.86	1.55	2.17	1.77	1.90	1.54	1.28	1.17	3.08	2.54
FeO(c)	3.47	3.66	2.83	3.38	3.36	2.43	2.34	3.35	3.53	3.86	3.92	4.18	4.25	4.37	2.47	2.88
MnO	0.08	0.08	0.12	0.18	0.04	0.04	0.08	0.05	0.08	0.12	0.12	0.12	0.11	0.12	0.16	0.13
MgO	36.38	36.56	36.85	36.90	37.10	36.98	37.02	36.65	36.22	36.21	36.19	36.24	36.09	36.08	35.39	35.18
CaO	0.40	0.55	0.23	0.20	0.24	0.24	0.26	0.24	0.19	0.20	0.24	0.26	0.18	0.26	0.97	0.99
Na_2O	0.10	0.07	0.04	0.06	0.04	0.11	0.04	0.10	0.08	0.07	0.08	0.07	0.06	0.07	0.22	0.24
K_2O	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Sum Ox%	100.17	101.35	100.91	101.44	102.02	101.34	101.08	100.81	100.4	100.74	100.98	101.3	100.53	100.81	100.36	100.18
Si	1.976	1.972	1.959	1.968	1.963	1.952	1.951	1.968	1.963	1.967	1.966	1.969	1.973	1.975	1.944	1.950
Ti	0.002	0.002	0.001	0.002	0.002	0.002	0.002	0.002	0.000	0.001	0.001	0.001	0.001	0.001	0.004	0.004
Al/Al IV	0.019	0.020	0.016	0.017	0.018	0.018	0.017	0.019	0.016	0.018	0.017	0.018	0.018	0.017	0.027	0.028
Al VI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cr	0.008	0.008	0.006	0.007	0.007	0.007	0.008	0.007	0.007	0.007	0.006	0.007	0.007	0.006	0.012	0.014
Fe^{3+}	0.025	0.028	0.062	0.041	0.049	0.075	0.073	0.040	0.056	0.045	0.049	0.039	0.033	0.030	0.079	0.066
Fe^{2+}	0.099	0.103	0.080	0.095	0.094	0.069	0.066	0.095	0.101	0.110	0.111	0.118	0.121	0.124	0.071	0.083
Mn^{2+}	0.002	0.002	0.003	0.005	0.001	0.001	0.002	0.001	0.002	0.004	0.003	0.003	0.003	0.003	0.005	0.004
Mg	1.848	1.839	1.862	1.854	1.855	1.861	1.867	1.853	1.843	1.837	1.833	1.830	1.834	1.829	1.807	1.799
Ca	0.015	0.020	0.008	0.007	0.008	0.009	0.010	0.009	0.007	0.007	0.009	0.009	0.007	0.010	0.036	0.036
Na	0.007	0.004	0.003	0.004	0.003	0.007	0.003	0.006	0.005	0.005	0.005	0.005	0.004	0.005	0.015	0.016
K	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sum Cat#	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Wo(Ca)	0.7	1.0	0.4	0.4	0.4	0.4	0.5	0.5	0.3	0.4	0.4	0.5	0.3	0.5	1.9	1.9
En(Mg)	94.2	93.7	95.5	94.8	94.8	96.0	96.1	94.7	94.5	94.0	93.9	93.5	93.5	93.2	94.4	93.8
Fs(Fe^{2+})	5.0	5.3	4.1	4.9	4.8	3.5	3.4	4.9	5.2	5.6	5.7	6.0	6.2	6.3	3.7	4.3
XMg	0.949	0.947	0.959	0.951	0.952	0.964	0.966	0.951	0.948	0.944	0.943	0.939	0.938	0.936	0.962	0.956

A6.2. Major-element composition of orthopyroxene in the xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 6 oxygens.

Label	32B_e_050	32B_e_051	32B_e_052	32B_f_057	32B_f_058	32B_g_059	32B_g_060	34_h_026	34_h_027	34_h_028	34_h_029	40A_i_151	40A_i_151	40A_i_152	40A_i_152	40A_j_153
Rock type	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	Hz	Hz	Hz	Hz	Hz
Rock microstr.	sheared	sheared	sheared	sheared	sheared	sheared	sheared	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
SiO_2	55.95	56.72	56.68	56.79	56.89	57.42	56.64	57.86	58.20	57.98	57.74	58.39	58.39	57.76	57.76	57.53
TiO_2	0.17	0.15	0.16	0.16	0.17	0.15	0.14	0.06	0.05	0.05	0.06	0.03	0.03	0.06	0.06	0.05
Al_2O_3	0.70	0.76	0.68	0.68	0.71	0.66	0.67	0.56	0.53	0.58	0.50	0.61	0.61	0.63	0.63	0.65
Cr_2O_3	0.49	0.50	0.47	0.49	0.49	0.44	0.46	0.39	0.34	0.38	0.27	0.26	0.26	0.26	0.26	0.24
Fe_2O_3	3.45	3.08	3.02	2.26	2.44	1.40	2.79	1.93	0.29	1.02	1.56	0.00	0.00	0.72	0.72	1.76
FeO(c)	1.98	2.50	2.53	3.04	3.05	3.96	2.67	3.12	4.35	3.73	3.26	5.25	5.25	4.51	4.51	3.76
MnO	0.13	0.13	0.11	0.08	0.16	0.16	0.19	0.14	0.09	0.16	0.11	0.12	0.12	0.16	0.16	0.14
MgO	35.23	35.24	35.25	35.08	35.05	34.99	35.12	36.64	36.13	36.36	36.54	35.13	35.13	35.03	35.03	35.38
CaO	0.97	1.02	0.98	0.96	1.02	0.98	0.98	0.22	0.27	0.31	0.20	0.60	0.60	0.54	0.54	0.57
Na_2O	0.19	0.26	0.26	0.24	0.25	0.23	0.24	0.09	0.10	0.06	0.07	0.22	0.22	0.28	0.28	0.25
K_2O	0.00	0.00	0.01	0.03	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Sum Ox%	99.27	100.35	100.14	99.8	100.24	100.39	99.91	101.01	100.35	100.64	100.33	100.62	100.62	99.95	99.95	100.33
Si	1.936	1.943	1.945	1.955	1.952	1.966	1.949	1.960	1.983	1.971	1.967	1.991	1.991	1.982	1.982	1.968
Ti	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001
Al/Al IV	0.028	0.031	0.028	0.027	0.029	0.027	0.027	0.023	0.017	0.023	0.020	0.009	0.009	0.018	0.018	0.026
Al VI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.016	0.016	0.008	0.008	0.000
Cr	0.013	0.013	0.013	0.013	0.013	0.012	0.013	0.011	0.009	0.010	0.007	0.007	0.007	0.007	0.007	0.006
Fe^{3+}	0.090	0.079	0.078	0.059	0.063	0.036	0.072	0.049	0.008	0.026	0.040	0.000	0.000	0.019	0.019	0.045
Fe^{2+}	0.057	0.072	0.073	0.087	0.088	0.113	0.077	0.088	0.124	0.106	0.093	0.150	0.150	0.130	0.130	0.108
Mn^{2+}	0.004	0.004	0.003	0.002	0.005	0.005	0.006	0.004	0.002	0.005	0.003	0.004	0.004	0.005	0.005	0.004
Mg	1.817	1.799	1.803	1.800	1.792	1.786	1.801	1.850	1.835	1.842	1.855	1.786	1.786	1.792	1.792	1.804
Ca	0.036	0.037	0.036	0.036	0.037	0.036	0.036	0.008	0.010	0.011	0.007	0.022	0.022	0.020	0.020	0.021
Na	0.013	0.017	0.017	0.016	0.017	0.015	0.016	0.006	0.007	0.004	0.005	0.015	0.015	0.019	0.019	0.016
K	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sum Cat#	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Wo(Ca)	1.9	2.0	1.9	1.8	1.9	1.9	1.9	0.4	0.5	0.6	0.4	1.1	1.1	1.0	1.0	1.1
En(Mg)	95.1	94.3	94.3	93.6	93.5	92.3	94.1	95.1	93.2	94.0	94.9	91.2	91.2	92.3	92.3	93.4
Fs(Fe^{2+})	3.0	3.8	3.8	4.5	4.6	5.9	4.0	4.5	6.3	5.4	4.7	7.7	7.7	6.7	6.7	5.6
XMg	0.969	0.962	0.961	0.954	0.953	0.940	0.959	0.954	0.937	0.946	0.952	0.923	0.923	0.933	0.933	0.944

A6.2. Major-element composition of orthopyroxene in the xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 6 oxygens.

Label	40A_j_153	40A_j_154	40A_j_154	40A_k_155	40A_k_155	40A_k_156	40A_k_156	40A_m_160	40A_m_161	40A_m_162	40B_b_082	40B_b_083	40B_a_080	40B_a_081	40B_b_085	40B_c_086
Rock type	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz
Rock microstr.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
SiO_2	57.53	57.98	57.98	57.53	57.53	57.33	57.33	57.64	57.50	57.93	56.22	58.04	58.05	58.19	57.94	58.23
TiO_2	0.05	0.11	0.11	0.06	0.06	0.08	0.08	0.09	0.08	0.08	0.11	0.08	0.08	0.07	0.08	0.11
Al_2O_3	0.65	0.69	0.69	0.68	0.68	0.64	0.64	0.64	0.65	0.61	0.70	0.65	0.57	0.62	0.68	0.62
Cr_2O_3	0.24	0.28	0.28	0.22	0.22	0.26	0.26	0.26	0.24	0.26	0.24	0.26	0.23	0.21	0.25	0.23
Fe_2O_3	1.76	0.00	0.00	2.11	2.11	0.78	0.78	1.59	0.55	0.53	5.09	2.43	2.35	1.37	1.08	2.50
FeO(c)	3.76	5.37	5.37	3.39	3.39	4.54	4.54	3.66	4.48	4.72	1.12	3.27	3.04	3.89	4.47	3.09
MnO	0.14	0.08	0.08	0.14	0.14	0.08	0.08	0.10	0.16	0.09	0.13	0.11	0.17	0.18	0.14	0.09
MgO	35.38	34.88	34.88	35.55	35.55	34.94	34.94	35.41	35.00	35.23	36.12	35.81	36.11	35.76	35.34	36.15
CaO	0.57	0.54	0.54	0.59	0.59	0.55	0.55	0.59	0.56	0.53	0.58	0.60	0.59	0.56	0.53	0.54
Na_2O	0.25	0.22	0.22	0.26	0.26	0.22	0.22	0.30	0.24	0.23	0.20	0.32	0.25	0.24	0.23	0.29
K_2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.03
Sum Ox%	100.33	100.13	100.13	100.54	100.54	99.43	99.43	100.27	99.47	100.2	100.52	101.58	101.44	101.1	100.75	101.87
Si	1.968	1.988	1.988	1.963	1.963	1.978	1.978	1.971	1.982	1.983	1.921	1.961	1.962	1.973	1.975	1.960
Ti	0.001	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.002	0.002	0.002	0.003
Al/Al IV	0.026	0.012	0.012	0.027	0.027	0.022	0.022	0.026	0.018	0.017	0.028	0.026	0.023	0.025	0.025	0.024
Al VI	0.000	0.016	0.016	0.000	0.000	0.005	0.005	0.000	0.009	0.008	0.000	0.000	0.000	0.000	0.002	0.000
Cr	0.006	0.007	0.007	0.006	0.006	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.007	0.006
Fe^{3+}	0.045	0.000	0.000	0.054	0.054	0.020	0.020	0.041	0.014	0.014	0.131	0.062	0.060	0.035	0.028	0.063
Fe^{2+}	0.108	0.154	0.154	0.097	0.097	0.131	0.131	0.105	0.129	0.135	0.032	0.092	0.086	0.110	0.127	0.087
Mn^{2+}	0.004	0.002	0.002	0.004	0.004	0.002	0.002	0.003	0.005	0.002	0.004	0.003	0.005	0.005	0.004	0.003
Mg	1.804	1.783	1.783	1.808	1.808	1.798	1.798	1.805	1.798	1.797	1.840	1.804	1.819	1.808	1.795	1.814
Ca	0.021	0.020	0.020	0.021	0.021	0.020	0.020	0.021	0.021	0.020	0.021	0.022	0.021	0.020	0.019	0.019
Na	0.016	0.015	0.015	0.017	0.017	0.015	0.015	0.020	0.016	0.015	0.013	0.021	0.016	0.016	0.015	0.019
K	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.002
Sum Cat#	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Wo(Ca)	1.1	1.0	1.0	1.1	1.1	1.0	1.0	1.1	1.1	1.0	1.1	1.1	1.1	1.0	1.0	1.0
En(Mg)	93.4	91.1	91.1	93.9	93.9	92.2	92.2	93.5	92.3	92.1	97.2	94.1	94.4	93.3	92.4	94.5
Fs(Fe^{2+})	5.6	7.9	7.9	5.0	5.0	6.7	6.7	5.4	6.6	6.9	1.7	4.8	4.5	5.7	6.6	4.5
XMg	0.944	0.921	0.921	0.949	0.949	0.932	0.932	0.945	0.933	0.930	0.983	0.951	0.955	0.943	0.934	0.954

A6.2. Major-element composition of orthopyroxene in the xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 6 oxygens.

Label	40B_c_087	40B_c_088	40B_c_089	40B_c_089	40B_c_090	40B_c_090	40B_c_092
Rock type	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz
Rock microstr.	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse
SiO_2	58.48	58.03	57.10	57.89	58.04	55.81	56.59
TiO_2	0.05	0.03	0.04	0.07	0.06	0.06	0.06
Al_2O_3	0.61	0.59	0.64	0.63	0.68	0.65	0.65
Cr_2O_3	0.23	0.21	0.24	0.22	0.19	0.24	0.25
Fe_2O_3	1.21	2.18	1.98	1.80	1.20	4.46	4.36
FeO(c)	4.24	3.57	3.54	3.74	4.14	1.36	1.51
MnO	0.15	0.12	0.11	0.04	0.13	0.17	0.11
MgO	35.68	35.81	35.17	35.62	35.54	35.47	35.82
CaO	0.56	0.52	0.56	0.56	0.56	0.53	0.60
Na_2O	0.27	0.27	0.27	0.28	0.24	0.29	0.32
K_2O	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sum Ox%	101.48	101.34	99.65	100.84	100.77	99.04	100.27
Si	1.977	1.965	1.966	1.969	1.975	1.934	1.937
Ti	0.001	0.001	0.001	0.002	0.001	0.002	0.002
Al/Al IV	0.023	0.024	0.026	0.025	0.025	0.026	0.026
Al VI	0.001	0.000	0.000	0.000	0.002	0.000	0.000
Cr	0.006	0.006	0.007	0.006	0.005	0.006	0.007
Fe^{3+}	0.031	0.056	0.051	0.046	0.031	0.116	0.112
Fe^{2+}	0.120	0.101	0.102	0.106	0.118	0.040	0.043
Mn^{2+}	0.004	0.004	0.003	0.001	0.004	0.005	0.003
Mg	1.798	1.808	1.805	1.806	1.803	1.832	1.827
Ca	0.020	0.019	0.021	0.021	0.021	0.020	0.022
Na	0.018	0.018	0.018	0.018	0.016	0.020	0.021
K	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Sum Cat#	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Wo(Ca)	1.0	1.0	1.1	1.1	1.1	1.0	1.2
En(Mg)	92.8	93.8	93.6	93.4	92.9	96.9	96.5
Fs(Fe^{2+})	6.2	5.2	5.3	5.5	6.1	2.1	2.3
XMg	0.938	0.947	0.946	0.944	0.939	0.979	0.977

A6.2. Major-element composition of clinopyroxene in xenoliths and clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 6 oxygens

Label	10_a_087	10_a_088	10_a_089	10_g_019	10_g_020	10_i_129	10_i_130	10_i_131	10_i_134	10_j_135	10_j_136	10_j_137	10_j_139	10_j_140	10_j_141	12-c-132
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Rock type	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Hz
Rock microst.	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared
Grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
SiO_2	54.68	54.84	54.86	54.58	54.52	54.76	54.45	54.63	55.2	54.77	54.84	55.1	54.93	53.94	54.96	56.39
TiO_2	0.29	0.34	0.34	1.04	0.96	0.32	0.35	0.34	0.33	0.35	0.3	0.29	0.34	0.36	0.3	0.14
Al_2O_3	2	2.07	2.04	1.35	1.19	1.94	1.95	2.03	2.02	1.92	2.02	1.99	1.91	2.06	2.03	0.69
Cr_2O_3	1.38	1.39	1.37	0.54	0.61	1.4	1.4	1.33	1.37	1.37	1.38	1.37	1.36	1.36	1.4	0.43
Fe_2O_3	0.5	1.61	1.58	1.39	1.32	1.98	1.9	1.32	0.45	1.51	2.33	0.59	1.37	2.51	1.14	2.33
FeO(c)	2.73	1.69	1.78	2.37	2.51	1.43	1.44	1.88	2.67	1.84	1	2.56	2.04	1.03	2.23	2.69
MnO	0.1	0.09	0.09	0.17	0.14	0.1	0.1	0.11	0.16	0.05	0.13	0.18	0.13	0.07	0.12	0.16
MgO	17.84	18.46	18.25	18.82	18.91	18.3	18.27	18	18.22	18.12	18.43	18.17	18.03	18.29	18.29	35.04
CaO	17.55	17.52	17.59	19.21	19.2	17.57	17.57	17.69	17.53	17.77	17.65	17.47	17.56	17.7	17.3	0.88
Na_2O	1.84	1.86	1.91	1.18	1.08	1.95	1.88	1.9	1.83	1.89	1.99	1.85	1.97	1.8	1.9	0.24
K_2O	0.01	0.05	0.04	0	0.03	0.03	0.02	0.04	0.01	0.04	0.01	0.03	0.03	0.03	0.02	0
Sum Ox%	98.9	99.9	99.85	100.65	100.47	99.76	99.34	99.26	99.81	99.62	100.1	99.57	99.66	99.14	99.7	98.99
Si	1.987	1.971	1.974	1.958	1.961	1.972	1.97	1.978	1.987	1.977	1.967	1.988	1.982	1.956	1.98	1.954
Ti	0.008	0.009	0.009	0.028	0.026	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.009	0.01	0.008	0.004
Al/Al IV	0.013	0.029	0.026	0.042	0.039	0.028	0.03	0.022	0.013	0.023	0.033	0.012	0.018	0.044	0.02	0.028
Al VI	0.073	0.059	0.061	0.015	0.011	0.055	0.053	0.065	0.072	0.058	0.053	0.072	0.063	0.045	0.066	0
Cr	0.04	0.039	0.039	0.015	0.017	0.04	0.04	0.038	0.039	0.039	0.039	0.039	0.039	0.039	0.04	0.012
Fe^{3+}	0.014	0.044	0.043	0.037	0.036	0.054	0.052	0.036	0.012	0.041	0.063	0.016	0.037	0.069	0.031	0.061
Fe^{2+}	0.083	0.051	0.054	0.071	0.075	0.043	0.043	0.057	0.08	0.056	0.03	0.077	0.062	0.031	0.067	0.078
Mn^{2+}	0.003	0.003	0.003	0.005	0.004	0.003	0.003	0.003	0.005	0.001	0.004	0.005	0.004	0.002	0.004	0.005
Mg	0.967	0.989	0.979	1.007	1.014	0.982	0.985	0.971	0.977	0.975	0.986	0.977	0.969	0.989	0.982	1.81
Ca	0.683	0.675	0.678	0.739	0.74	0.678	0.681	0.686	0.676	0.687	0.679	0.675	0.679	0.688	0.668	0.033
Na	0.129	0.13	0.133	0.082	0.075	0.136	0.132	0.133	0.128	0.132	0.138	0.129	0.137	0.127	0.133	0.016
K	0	0.002	0.002	0	0.001	0.001	0.001	0.002	0.001	0.002	0	0.001	0.001	0.001	0.001	0
Sum Cat#	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Wo(Ca)	39.433	39.36	39.648	40.671	40.442	39.799	39.829	40.037	39	40.002	40.05	39.046	39.703	40.276	38.887	1.703
En(Mg)	55.785	57.682	57.222	55.417	55.434	57.67	57.629	56.651	56.367	56.765	58.181	56.494	56.689	57.897	57.198	94.244
Fs(Fe^{2+})	4.782	2.958	3.129	3.912	4.124	2.531	2.542	3.312	4.633	3.234	1.768	4.46	3.608	1.827	3.914	4.053
XMg	0.921	0.951	0.948	0.934	0.931	0.958	0.958	0.945	0.924	0.946	0.971	0.927	0.94	0.969	0.936	0.959

A6.2. Major-element composition of clinopyroxene in xenoliths and clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 6 oxygens

Label	12-g-125	12-g-126	12-g-127	12-g-128	12-g-131	24B_a_044	24B_a_045	24B_a_048	24B_c_049	24B_d_053	24B_d_054	24B_e_055	24B_e_056	26_g_021	26_g_022	26_i_026
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Rock type	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	gm	gm	gm
Rock microst.	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	-	-	-
Grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	-	-	-
SiO_2	53.96	54.48	54.53	54.02	55.76	54.62	53.83	54.17	54.44	54.72	54.4	54.2	54.65	54.57	55.68	49.39
TiO_2	0.33	0.31	0.31	0.31	0.14	0.14	0.07	0.12	0.05	0.15	0.11	0.12	0.1	0.26	0.21	0.69
Al_2O_3	1.82	1.72	1.81	1.77	0.74	0.54	0.56	0.54	0.46	0.82	0.74	0.64	0.56	2.47	2.29	7.25
Cr_2O_3	1.84	1.35	1.86	1.72	0.43	1.75	1.74	1.67	1.71	2.29	2.48	1.92	2.07	3.97	3.8	0.06
Fe_2O_3	3.39	2.39	2.33	3.07	3.87	1.73	2.91	3.18	2.91	2.67	3.06	2.73	2.99	2.99	1.31	6.01
FeO(c)	0.33	1.09	1.1	0.4	1.43	1.11	0	0	0.12	0.21	0	0	0	0.47	2.09	3.34
MnO	0.12	0.11	0.1	0.14	0.09	0.01	0.03	0.07	0.07	0.06	0.01	0.07	0.03	0.06	0.1	0.02
MgO	19.07	19.39	19.05	19.29	35.26	16.19	16.39	16.4	16.23	15.92	15.69	16.42	16.11	14.46	14.59	10.22
CaO	16.78	17.03	16.74	16.76	0.9	22.62	22.5	22.31	22.74	22.14	21.74	22.3	22.24	18.21	18.54	19.7
Na_2O	1.89	1.68	1.89	1.82	0.28	1.4	1.58	1.63	1.49	1.85	2.01	1.68	1.84	3.41	3.19	2.77
K_2O	0.04	0.03	0.03	0.02	0	0	0	0	0	0	0.01	0.02	0.02	0.02	0.02	0
Sum Ox%	99.56	99.57	99.76	99.32	98.9	100.11	99.62	100.09	100.22	100.83	100.26	100.11	100.61	100.89	101.8	99.46
Si	1.947	1.963	1.962	1.952	1.934	1.985	1.967	1.969	1.977	1.974	1.974	1.969	1.976	1.963	1.986	1.837
Ti	0.009	0.008	0.008	0.009	0.004	0.004	0.002	0.003	0.001	0.004	0.003	0.003	0.003	0.007	0.006	0.019
Al/Al IV	0.053	0.037	0.038	0.048	0.03	0.015	0.024	0.023	0.02	0.026	0.026	0.028	0.024	0.037	0.014	0.163
Al VI	0.024	0.036	0.039	0.027	0	0.008	0	0	0	0.009	0.006	0	0	0.068	0.082	0.154
Cr	0.053	0.038	0.053	0.049	0.012	0.05	0.05	0.048	0.049	0.065	0.071	0.055	0.059	0.113	0.107	0.002
Fe^{3+}	0.092	0.065	0.063	0.084	0.101	0.047	0.08	0.087	0.08	0.072	0.083	0.075	0.081	0.081	0.035	0.168
Fe^{2+}	0.01	0.033	0.033	0.012	0.042	0.034	0	0	0.003	0.006	0	0	0	0.014	0.062	0.104
Mn^{2+}	0.004	0.003	0.003	0.004	0.003	0	0.001	0.002	0.002	0.002	0	0.002	0.001	0.002	0.003	0.001
Mg	1.026	1.041	1.022	1.039	1.823	0.877	0.893	0.889	0.879	0.856	0.849	0.889	0.868	0.775	0.775	0.567
Ca	0.649	0.657	0.645	0.649	0.033	0.881	0.881	0.869	0.884	0.856	0.845	0.868	0.861	0.702	0.708	0.785
Na	0.132	0.117	0.132	0.128	0.019	0.098	0.112	0.115	0.105	0.129	0.142	0.118	0.129	0.238	0.22	0.2
K	0.002	0.001	0.002	0.001	0	0	0	0	0	0	0	0.001	0.001	0.001	0.001	0
Sum Cat#	4	4	4	4	4	4	4.01	4.005	4	4	4.001	4.008	4.004	4	4	4
Wo(Ca)	38.519	37.971	37.955	38.171	1.758	49.155	49.665	49.433	50.071	49.802	49.9	49.394	49.807	47.067	45.813	53.927
En(Mg)	60.884	60.137	60.105	61.12	96.054	48.954	50.335	50.568	49.731	49.837	50.1	50.606	50.193	51.977	50.158	38.933
Fs(Fe^{2+})	0.597	1.892	1.94	0.708	2.189	1.891	0	0	0.198	0.362	0	0	0	0.956	4.029	7.14
XMg	0.99	0.97	0.969	0.989	0.978	0.963	1	1	0.996	0.993	1	1	1	0.982	0.926	0.845

A6.2. Major-element composition of clinopyroxene in xenoliths and clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 6 oxygens

Label	26_i_027	26_i_028	27_a_145	27_b_153	27_b_154	27_b_155	27_c_156	27_c_157	27_c_158	27_d_165	27_d_166	27_d_167	27_e_168	27_e_169	27_f_174	27_i_175
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Rock type	gm	gm	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom
Rock microst.	-	-	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Grain size	-	-	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
SiO_2	49.23	54.33	50.8	50.51	50.71	50.55	51.23	52.17	51.02	50.7	50.69	50.45	50.81	50.28	50.13	50.9
TiO_2	0.57	0.15	0.41	0.37	0.36	0.45	0.24	0.34	0.34	0.43	0.4	0.38	0.32	0.34	0.25	0.3
Al_2O_3	6.94	1.54	6.24	5.02	5.32	5.54	4.28	4.44	4.63	4.49	4.51	4.74	4.94	4.93	4.48	4.25
Cr_2O_3	0.08	0.88	0.12	0.09	0.09	0.14	0.08	0.11	0.06	0.1	0.07	0.08	0.06	0.09	0.07	0.07
Fe_2O_3	7.53	4.48	2.49	3.56	3.2	3.13	2.78	1.24	3.11	3.43	5.11	2.81	3.88	3.04	4.81	2.78
FeO(c)	2.51	0	6.3	5.39	5.68	5.85	6.62	7.63	5.89	5.83	4.15	8.24	5.26	6.42	4.13	6.13
MnO	0.11	0.07	0.1	0.19	0.17	0.12	0.14	0.15	0.12	0.15	0.22	0.12	0.16	0.12	0.17	0.19
MgO	10.43	15.73	11.2	11.8	11.51	11.56	11.97	11.69	11.74	11.94	12.02	12.41	11.89	12.82	12.02	11.95
CaO	19.22	21.94	20.57	20.81	20.56	20.29	20.48	21.12	20.84	20.58	20.96	18.41	20.74	18.63	20.94	20.55
Na_2O	2.92	2.07	1.81	1.61	1.78	1.79	1.54	1.51	1.66	1.59	1.79	1.42	1.69	1.54	1.64	1.54
K_2O	0	0.02	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0.01
Sum Ox%	99.53	101.22	100.03	99.35	99.4	99.41	99.36	100.4	99.41	99.24	99.93	99.06	99.74	98.22	98.64	98.66
Si	1.831	1.955	1.881	1.886	1.891	1.884	1.914	1.929	1.904	1.897	1.882	1.895	1.889	1.893	1.885	1.914
Ti	0.016	0.004	0.011	0.01	0.01	0.013	0.007	0.009	0.01	0.012	0.011	0.011	0.009	0.01	0.007	0.008
Al/Al IV	0.169	0.045	0.119	0.114	0.109	0.116	0.086	0.071	0.096	0.103	0.118	0.105	0.111	0.107	0.115	0.086
Al VI	0.135	0.021	0.154	0.107	0.125	0.128	0.103	0.123	0.108	0.095	0.08	0.105	0.105	0.112	0.083	0.102
Cr	0.002	0.025	0.003	0.003	0.003	0.004	0.002	0.003	0.002	0.003	0.002	0.002	0.002	0.003	0.002	0.002
Fe^{3+}	0.211	0.121	0.069	0.1	0.09	0.088	0.078	0.035	0.087	0.096	0.143	0.079	0.108	0.086	0.136	0.079
Fe^{2+}	0.078	0	0.195	0.168	0.177	0.182	0.207	0.236	0.184	0.182	0.129	0.259	0.164	0.202	0.13	0.193
Mn^{2+}	0.003	0.002	0.003	0.006	0.005	0.004	0.004	0.005	0.004	0.005	0.007	0.004	0.005	0.004	0.005	0.006
Mg	0.578	0.844	0.618	0.657	0.64	0.642	0.667	0.644	0.653	0.666	0.665	0.695	0.659	0.719	0.674	0.67
Ca	0.766	0.846	0.816	0.832	0.822	0.81	0.82	0.837	0.833	0.825	0.834	0.741	0.826	0.752	0.844	0.828
Na	0.211	0.145	0.13	0.116	0.129	0.129	0.111	0.108	0.12	0.115	0.129	0.104	0.122	0.112	0.119	0.112
K	0	0.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0.001
Sum Cat#	4	4.008	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Wo(Ca)	53.852	50.065	50.09	50.217	50.14	49.564	48.408	48.732	49.887	49.307	51.231	43.715	50.12	44.923	51.209	48.977
En(Mg)	40.661	49.935	37.936	39.631	39.04	39.287	39.37	37.522	39.103	39.801	40.847	41.007	39.958	43.003	40.901	39.625
Fs(Fe^{2+})	5.487	0	11.973	10.152	10.82	11.149	12.222	13.746	11.01	10.892	7.922	15.277	9.922	12.074	7.889	11.398
XMg	0.881	1	0.76	0.796	0.783	0.779	0.763	0.732	0.78	0.785	0.838	0.729	0.801	0.781	0.838	0.777

A6.2. Major-element composition of clinopyroxene in xenoliths and clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 6 oxygens

Label	27_i_176	28_e_50	28_e_51	28_e_52	28_f_53	28_h_001	28_h_002	28_h_003	28_h_004	28_l_109	28_l_110	28_l_112	28_l_113	30A_a_104	30A_a_105	30A_c_108
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Rock type	H metasom	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Lhz	grt-Lhz	grt-Lhz
Rock microst.	coarse	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	coarse	coarse	coarse
Grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	fine	fine	fine	fine	coarse	coarse	coarse
SiO_2	49.62	54.77	55.41	55.25	55.08	54.83	55.03	54.08	54.63	53.39	54.17	53.87	54.67	54.14	55.32	53.5
TiO_2	0.42	0.28	0.28	0.3	0.29	0.24	0.2	0.31	0.29	1.37	0.93	0.9	0.41	0.26	0.34	0.34
Al_2O_3	5.6	1.71	1.64	1.64	1.78	1.76	1.67	1.47	1.8	2.88	2.25	1.94	0.95	2.93	3	2.37
Cr_2O_3	0.08	1.55	1.01	1.2	1.65	1.95	1.93	1.74	2.05	1.92	1.38	1.14	0.67	1.61	1.66	1.66
Fe_2O_3	5.02	2.36	1.44	1.06	2.55	2.05	0.5	1.05	2.94	0	0.85	0.14	1.15	2.98	2.91	3.28
FeO(c)	4.2	1.18	1.94	2.23	1.13	1.44	2.82	2.66	0.88	3.67	2.78	3.75	3.11	0	0.1	0
MnO	0.19	0.06	0.12	0.09	0.1	0.15	0.11	0.16	0.16	0.15	0.19	0.1	0.22	0.09	0.08	0.05
MgO	11.57	19.13	19.45	19.17	19.15	18.91	18.58	18.5	19.32	16.62	18	17.86	20.7	15.78	15.71	16.09
CaO	20.52	17.25	17.41	17.48	17.25	16.74	16.99	17.56	16.77	19.07	18.8	18.99	17.1	18.69	18.48	20.55
Na_2O	1.81	1.77	1.6	1.59	1.85	1.92	1.73	1.43	1.83	1.55	1.4	1.12	0.76	3.04	3.15	2.15
K_2O	0	0.03	0.03	0.03	0.03	0.04	0.04	0.01	0.04	0	0	0.01	0.03	0	0.01	0
Sum Ox%	99.04	100.1	100.32	100.03	100.86	100.04	99.62	98.97	100.73	100.62	100.74	99.82	99.76	99.51	100.74	99.99
Si	1.858	1.965	1.98	1.982	1.962	1.969	1.986	1.971	1.95	1.929	1.945	1.955	1.971	1.961	1.974	1.939
Ti	0.012	0.008	0.008	0.008	0.008	0.006	0.005	0.009	0.008	0.037	0.025	0.025	0.011	0.007	0.009	0.009
Al/Al IV	0.142	0.035	0.02	0.018	0.038	0.031	0.014	0.029	0.05	0.071	0.055	0.045	0.029	0.039	0.026	0.061
Al VI	0.106	0.037	0.049	0.051	0.037	0.043	0.058	0.034	0.026	0.051	0.04	0.038	0.011	0.086	0.101	0.041
Cr	0.002	0.044	0.028	0.034	0.046	0.055	0.055	0.05	0.058	0.055	0.039	0.033	0.019	0.046	0.047	0.048
Fe^{3+}	0.141	0.064	0.039	0.029	0.068	0.055	0.014	0.029	0.079	0	0.023	0.004	0.031	0.081	0.078	0.089
Fe^{2+}	0.132	0.035	0.058	0.067	0.034	0.043	0.085	0.081	0.026	0.111	0.083	0.114	0.094	0	0.003	0
Mn^{2+}	0.006	0.002	0.004	0.003	0.003	0.005	0.003	0.005	0.005	0.005	0.006	0.003	0.007	0.003	0.002	0.002
Mg	0.646	1.023	1.036	1.025	1.017	1.012	1	1.005	1.028	0.895	0.963	0.966	1.112	0.852	0.836	0.87
Ca	0.824	0.663	0.667	0.672	0.658	0.644	0.657	0.686	0.641	0.738	0.723	0.738	0.66	0.725	0.706	0.798
Na	0.131	0.123	0.111	0.11	0.128	0.134	0.121	0.101	0.127	0.108	0.097	0.079	0.053	0.213	0.218	0.151
K	0	0.002	0.001	0.002	0.001	0.002	0.002	0.001	0.002	0	0	0	0.001	0	0	0
Sum Cat#	4	4	4	4	4	4	4	4	4	4	4	4	4	4.013	4	4.008
Wo(Ca)	51.436	38.527	37.865	38.104	38.532	37.886	37.721	38.708	37.824	42.322	40.863	40.606	35.377	45.987	45.729	47.862
En(Mg)	40.349	59.422	58.842	58.108	59.495	59.562	57.393	56.719	60.621	51.315	54.427	53.13	59.597	54.013	54.084	52.138
Fs(Fe^{2+})	8.215	2.051	3.292	3.789	1.973	2.552	4.886	4.572	1.555	6.363	4.71	6.264	5.026	0	0.187	0
XMg	0.831	0.967	0.947	0.939	0.968	0.959	0.922	0.925	0.975	0.89	0.92	0.895	0.922	1	0.997	1

A6.2. Major-element composition of clinopyroxene in xenoliths and clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 6 oxygens

Label	30A_c_109	30A_f_117	30A_f_118	30A_f_119	30A_g_120	30A_h_121	30A_n_131	30A_n_132	30b-d-42	30b-d-43	30b-d-44	30b-d-45	30b-e-51	30b-e-52	30b-g-53	30b-j-61
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Rock type	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz
Rock microst.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
SiO_2	55.05	54.53	54.73	54.09	54.59	54.65	54.64	54.77	54.87	54.06	54.82	54.89	54.92	55.11	55.07	55.31
TiO_2	0.25	0.24	0.29	0.31	0.28	0.26	0.28	0.29	0.18	0.19	0.19	0.18	0.17	0.17	0.25	0.15
Al_2O_3	2.79	2.63	2.73	3.11	2.93	3.22	2.99	3.05	2.72	2.5	2.72	2.58	2.91	2.83	2.37	2.61
Cr_2O_3	1.62	1.58	1.56	1.83	1.57	1.96	1.6	1.8	2.03	1.85	2.1	2.1	2.6	2.44	2.17	2.1
Fe_2O_3	2.88	2.78	2.79	2.87	3.09	3.26	3.14	2.76	0.94	2.07	0.64	0.64	1.89	1.74	1.96	1.71
FeO(c)	0	0	0	0	0	0	0	0	1.01	0	1.34	1.21	0.22	0.32	0.11	0.42
MnO	0.07	0.08	0.04	0.09	0.08	0.06	0.11	0.05	0.05	0.06	0.02	0.03	0.02	0.08	0.1	0.05
MgO	16.19	16.03	16.19	15.75	15.99	15.44	15.91	15.91	15.6	15.79	15.53	15.75	15.25	15.29	16.61	15.87
CaO	18.86	18.95	19.13	18.43	18.8	18.23	18.9	18.7	19.42	19.79	19.2	19.44	19.15	19.74	19.78	20.11
Na_2O	2.87	2.9	2.71	3.16	3.06	3.24	2.96	3.05	2.59	2.43	2.6	2.5	2.99	2.83	2.34	2.53
K_2O	0	0	0.01	0	0.01	0	0	0.03	0	0	0.01	0.01	0.01	0.01	0.03	0.01
Sum Ox%	100.58	99.72	100.18	99.64	100.4	100.33	100.53	100.4	99.41	98.75	99.16	99.32	100.12	100.55	100.78	100.87
Si	1.969	1.969	1.966	1.956	1.959	1.962	1.959	1.963	1.986	1.972	1.99	1.989	1.976	1.976	1.968	1.976
Ti	0.007	0.007	0.008	0.009	0.007	0.007	0.008	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.007	0.004
Al/Al IV	0.031	0.031	0.034	0.044	0.041	0.038	0.041	0.037	0.014	0.028	0.01	0.011	0.024	0.024	0.032	0.024
Al VI	0.087	0.081	0.082	0.089	0.083	0.098	0.085	0.092	0.102	0.079	0.106	0.099	0.099	0.096	0.068	0.086
Cr	0.046	0.045	0.044	0.052	0.045	0.056	0.045	0.051	0.058	0.053	0.06	0.06	0.074	0.069	0.061	0.059
Fe^{3+}	0.078	0.076	0.075	0.078	0.084	0.088	0.085	0.074	0.026	0.057	0.017	0.017	0.051	0.047	0.053	0.046
Fe^{2+}	0	0	0	0	0	0	0	0	0.031	0	0.041	0.037	0.007	0.01	0.003	0.013
Mn^{2+}	0.002	0.002	0.001	0.003	0.003	0.002	0.003	0.002	0.001	0.002	0.001	0.001	0.001	0.002	0.003	0.002
Mg	0.863	0.863	0.867	0.849	0.856	0.826	0.85	0.85	0.842	0.859	0.84	0.851	0.818	0.817	0.885	0.845
Ca	0.723	0.733	0.736	0.714	0.723	0.701	0.726	0.718	0.753	0.773	0.746	0.755	0.738	0.758	0.757	0.77
Na	0.199	0.203	0.189	0.222	0.213	0.225	0.206	0.212	0.182	0.172	0.183	0.175	0.208	0.196	0.162	0.175
K	0	0	0	0	0	0	0	0.001	0	0	0	0	0	0	0.002	0
Sum Cat#	4.003	4.009	4.003	4.015	4.014	4.003	4.008	4.008	4	4	4	4	4	4	4	4
Wo(Ca)	45.571	45.941	45.925	45.691	45.81	45.916	46.053	45.802	46.33	47.391	45.875	45.961	47.23	47.84	46.032	47.297
En(Mg)	54.429	54.059	54.075	54.309	54.19	54.084	53.947	54.198	51.792	52.609	51.633	51.81	52.341	51.559	53.77	51.923
Fs(Fe^{2+})	0	0	0	0	0	0	0	0	1.879	0	2.492	2.229	0.429	0.601	0.199	0.779
XMg	1	1	1	1	1	1	1	1	0.965	1	0.954	0.959	0.992	0.988	0.996	0.985

A6.2. Major-element composition of clinopyroxene in xenoliths and clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 6 oxygens

Label	30b-j-62	30b-j-63	30b-j-64	31_m_114	31_m_115	31_m_116	34_h_030	34_h_031	34_h_032	34_h_033	35_a_032	35_a_033	35_b_037	35_b_038	35_f_045	35_f_046
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Rock type	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	granulite	granulite	granulite	granulite	granulite	granulite
Rock microst.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
SiO_2	55.41	54.42	55.11	54.89	54.79	54.93	54.73	54.86	55.09	55.12	51.7	51.89	51.96	52.16	51.59	51.75
TiO_2	0.16	0.2	0.15	0.05	0.04	0.08	0.09	0.1	0.09	0.08	0.28	0.28	0.31	0.32	0.3	0.24
Al_2O_3	2.42	2.84	2.6	2.29	2.13	2.22	3.39	3.32	3.39	3.1	3.83	3.88	3.93	3.85	3.83	3.79
Cr_2O_3	2.01	2.17	2.02	1.78	1.84	1.76	3.06	2.8	3.34	2.88	0.05	0.01	0.04	0.03	0.01	0.02
Fe_2O_3	0.59	2.07	2.1	2.14	2.01	2.02	1.39	1.84	1.62	1.45	5.61	5.93	5	4.96	5.36	6
FeO(c)	1.26	0	0	0	0	0	0.41	0.27	0.38	0.55	3.7	3.44	4.7	5.25	4.66	3.87
MnO	0.12	0.1	0.13	0.02	0.04	0.08	0.04	0.03	0.01	0.08	0.04	0.11	0.05	0.04	0.07	0.15
MgO	15.88	15.8	16.08	16.27	16.22	16.33	14.53	14.75	14.38	14.69	12.3	12.4	12.04	12.2	11.98	12.35
CaO	19.89	19.67	20.27	21.06	21.01	20.93	18.67	18.67	18.17	19.24	20.02	20.22	20.31	20.09	20.03	20.3
Na_2O	2.43	2.76	2.54	2.19	2.16	2.18	3.28	3.27	3.6	3.13	2.31	2.31	2.19	2.13	2.21	2.17
K_2O	0	0	0.01	0.01	0.03	0	0.02	0.01	0	0	0	0	0	0	0	0
Sum Ox%	100.17	100	101.01	100.69	100.26	100.54	99.6	99.91	100.08	100.31	99.86	100.49	100.53	101.02	100.04	100.65
Si	1.992	1.962	1.967	1.968	1.972	1.971	1.978	1.976	1.981	1.981	1.913	1.908	1.915	1.915	1.912	1.905
Ti	0.004	0.005	0.004	0.001	0.001	0.002	0.002	0.003	0.003	0.002	0.008	0.008	0.008	0.009	0.008	0.007
Al/Al IV	0.008	0.038	0.033	0.032	0.028	0.029	0.022	0.024	0.019	0.019	0.087	0.092	0.085	0.085	0.088	0.095
Al VI	0.095	0.082	0.077	0.064	0.062	0.065	0.123	0.117	0.125	0.112	0.08	0.077	0.085	0.082	0.079	0.07
Cr	0.057	0.062	0.057	0.05	0.052	0.05	0.087	0.08	0.095	0.082	0.002	0	0.001	0.001	0	0.001
Fe^{3+}	0.016	0.056	0.056	0.058	0.054	0.054	0.038	0.05	0.044	0.039	0.156	0.164	0.139	0.137	0.15	0.166
Fe^{2+}	0.038	0	0	0	0	0	0.012	0.008	0.011	0.016	0.115	0.106	0.145	0.161	0.144	0.119
Mn^{2+}	0.004	0.003	0.004	0	0.001	0.003	0.001	0.001	0	0.002	0.001	0.004	0.002	0.001	0.002	0.005
Mg	0.851	0.849	0.856	0.869	0.87	0.874	0.783	0.792	0.771	0.787	0.679	0.68	0.661	0.668	0.662	0.678
Ca	0.766	0.76	0.775	0.809	0.81	0.805	0.723	0.721	0.7	0.741	0.794	0.797	0.802	0.79	0.795	0.801
Na	0.169	0.193	0.176	0.152	0.151	0.152	0.23	0.228	0.251	0.218	0.166	0.165	0.157	0.152	0.159	0.155
K	0	0	0	0	0.001	0	0.001	0	0	0	0	0	0	0	0	0
Sum Cat#	4	4.01	4.005	4.005	4.004	4.004	4	4	4	4	4	4	4	4	4	4
Wo(Ca)	46.293	47.229	47.529	48.195	48.216	47.95	47.619	47.388	47.236	47.967	50.022	50.349	49.863	48.8	49.661	50.128
En(Mg)	51.42	52.771	52.471	51.805	51.784	52.05	51.575	52.085	51.998	50.965	42.757	42.96	41.128	41.247	41.319	42.422
Fs(Fe^{2+})	2.288	0	0	0	0	0	0.806	0.527	0.766	1.068	7.221	6.691	9.009	9.953	9.02	7.45
XMg	0.957	1	1	1	1	1	0.985	0.99	0.985	0.979	0.856	0.865	0.82	0.806	0.821	0.851

A6.2. Major-element composition of clinopyroxene in xenoliths and clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 6 oxygens

Label	35_f_047	35_f_048	37_a_005	37_a_010	37_a_011	37_a_012	37_a_077	37_a_078	37_e_017	37_f_018	37_f_019	37_f_120	37_f_121	42_a_142	42_a_143	42_a_144
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Rock type	granulite	granulite	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	H metasom	H metasom	H metasom
Rock microst.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
SiO_2	51.8	52.33	54.86	54.86	54.29	54.77	54.84	54.58	54.72	54.51	54.61	53.16	54.62	50.11	50.47	50.96
TiO_2	0.29	0.31	0.27	0.27	0.26	0.28	0.24	0.26	0.24	0.25	0.26	0.26	0.25	0.4	0.43	0.36
Al_2O_3	3.91	3.93	3.16	3.72	3.04	3.07	3	2.95	2.97	2.86	2.86	2.94	2.83	4.64	4.95	4.55
Cr_2O_3	0.03	0.01	4.44	4.03	4.4	4.72	3.94	4.39	3.03	3.43	3.6	3.87	3.65	0.42	0.43	0.45
Fe_2O_3	5.7	5.01	2.8	2.75	2.62	2.77	2.42	2.75	2.83	2.66	2.78	2.75	2.9	4.36	5.07	4.43
FeO(c)	4.11	4.99	0	0	0	0	0.42	0	0	0	0	0	0	3.94	3.33	3.95
MnO	0.1	0.1	0.05	0.09	0.11	0.06	0.09	0.09	0.13	0.07	0.08	0.08	0.06	0.21	0.17	0.18
MgO	12.09	12.16	14.23	14.38	14.38	14.2	14.3	14.21	15.08	15.01	14.89	14.59	14.67	12.46	12.38	12.44
CaO	20.13	20.25	16.53	16.28	17.19	16.54	17.54	17.23	17.79	17.81	17.77	17.23	17.92	20.95	21.13	21.62
Na_2O	2.29	2.19	4.16	4.46	3.97	4.3	3.72	4.03	3.51	3.64	3.56	3.88	3.66	1.53	1.75	1.57
K_2O	0.01	0	0.01	0.01	0	0.02	0.02	0.02	0.04	0.02	0.01	0.04	0.01	0	0	0
Sum Ox%	100.46	101.28	100.51	100.85	100.28	100.73	100.53	100.52	100.34	100.26	100.42	98.8	100.57	99.02	100.11	100.5
Si	1.91	1.915	1.969	1.961	1.959	1.965	1.971	1.964	1.967	1.963	1.964	1.949	1.964	1.874	1.866	1.879
Ti	0.008	0.008	0.007	0.007	0.007	0.007	0.006	0.007	0.006	0.007	0.007	0.007	0.007	0.011	0.012	0.01
Al/Al IV	0.09	0.085	0.031	0.039	0.041	0.035	0.029	0.036	0.033	0.037	0.036	0.051	0.036	0.126	0.134	0.121
Al VI	0.08	0.085	0.103	0.117	0.088	0.095	0.098	0.089	0.093	0.085	0.085	0.076	0.083	0.079	0.082	0.077
Cr	0.001	0	0.126	0.114	0.126	0.134	0.112	0.125	0.086	0.098	0.102	0.112	0.104	0.012	0.013	0.013
Fe^{3+}	0.158	0.138	0.076	0.074	0.071	0.075	0.066	0.074	0.077	0.072	0.075	0.076	0.079	0.123	0.141	0.123
Fe^{2+}	0.127	0.153	0	0	0	0	0.013	0	0	0	0	0	0	0.123	0.103	0.122
Mn^{2+}	0.003	0.003	0.002	0.003	0.003	0.002	0.003	0.003	0.004	0.002	0.002	0.002	0.002	0.007	0.005	0.006
Mg	0.664	0.663	0.761	0.766	0.773	0.759	0.766	0.762	0.808	0.806	0.798	0.797	0.786	0.695	0.682	0.684
Ca	0.795	0.794	0.636	0.623	0.664	0.636	0.676	0.664	0.685	0.687	0.685	0.677	0.69	0.839	0.837	0.854
Na	0.164	0.155	0.29	0.309	0.278	0.299	0.259	0.281	0.245	0.254	0.248	0.276	0.255	0.111	0.125	0.112
K	0.001	0	0.001	0.001	0	0.001	0.001	0.001	0.002	0.001	0.001	0.002	0.001	0	0	0
Sum Cat#	4	4	4.001	4.015	4.011	4.008	4	4.007	4.005	4.012	4.004	4.025	4.006	4	4	4
Wo(Ca)	50.127	49.314	45.503	44.855	46.212	45.571	46.453	46.564	45.888	46.037	46.168	45.908	46.747	50.654	51.586	51.469
En(Mg)	41.879	41.206	54.497	55.145	53.788	54.429	52.682	53.436	54.112	53.963	53.832	54.092	53.253	41.916	42.063	41.19
Fs(Fe^{2+})	7.994	9.48	0	0	0	0	0.865	0	0	0	0	0	0	7.43	6.351	7.341
XMg	0.84	0.813	1	1	1	1	0.984	1	1	1	1	1	1	0.849	0.869	0.849

A6.2. Major-element composition of clinopyroxene in xenoliths and clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 6 oxygens

Label	42_a_146	42_a_147	42_a_148	42_b_152	42_b_153	42_b_154	42_c_159	42_c_160	42_d_161	42_d_162	44_c_127	44_c_128	44_c_129	44_d_131	44_e_134	44_e_135
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Rock type	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom
Rock microst.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
SiO_2	50.59	49.66	50.9	51.35	51.27	50.83	50.58	50.69	50.69	51.37	54.17	53.94	54.16	54.04	54.15	53.84
TiO_2	0.39	0.47	0.45	0.37	0.39	0.39	0.39	0.47	0.37	0.41	0.24	0.28	0.23	0.27	0.28	0.28
Al_2O_3	4.63	4.9	4.91	4.67	4.75	4.8	4.96	4.87	4.74	4.85	2.99	2.99	3.02	3.09	3.15	3.03
Cr_2O_3	0.42	0.45	0.47	0.44	0.4	0.37	0.47	0.43	0.46	0.42	0.16	0.11	0.15	0.15	0.13	0.14
Fe_2O_3	3.42	5.25	3.37	3.02	3.67	4.52	4.35	3.51	3.92	1.88	3.51	4.15	3.84	4.44	4.64	4.56
FeO(c)	5.8	3.35	5.34	5.12	4.27	3.54	4.13	4.58	4.17	7.83	1.87	1.28	1.53	1.23	1.32	1.36
MnO	0.11	0.14	0.21	0.18	0.15	0.15	0.12	0.22	0.16	0.18	0.09	0.05	0.13	0.08	0.12	0.09
MgO	13.05	12.93	12.42	12.42	12.56	12.43	12.26	12.24	12.37	13.13	14.58	14.42	14.58	14.39	14.43	14.61
CaO	19.92	20.4	20.53	21.13	21.26	20.95	21.2	21.33	21.61	18.95	18.9	19.19	18.98	18.92	18.48	18.67
Na_2O	1.33	1.54	1.57	1.55	1.64	1.82	1.62	1.53	1.48	1.31	2.75	2.82	2.79	2.93	3.04	2.85
K_2O	0	0	0	0.02	0	0	0.01	0	0.01	0.02	0.02	0.03	0.03	0.02	0.02	0.01
Sum Ox%	99.66	99.1	100.18	100.25	100.37	99.79	100.08	99.87	99.98	100.35	99.29	99.24	99.43	99.57	99.75	99.44
Si	1.881	1.854	1.883	1.896	1.888	1.882	1.872	1.88	1.878	1.898	1.976	1.97	1.973	1.967	1.967	1.963
Ti	0.011	0.013	0.012	0.01	0.011	0.011	0.011	0.013	0.01	0.012	0.007	0.008	0.006	0.007	0.008	0.008
Al/Al IV	0.119	0.146	0.117	0.104	0.112	0.118	0.128	0.12	0.122	0.102	0.024	0.03	0.027	0.033	0.033	0.037
Al VI	0.084	0.07	0.097	0.099	0.094	0.091	0.088	0.093	0.085	0.109	0.105	0.098	0.103	0.1	0.102	0.094
Cr	0.012	0.013	0.014	0.013	0.012	0.011	0.014	0.013	0.014	0.012	0.005	0.003	0.004	0.004	0.004	0.004
Fe^{3+}	0.096	0.148	0.094	0.084	0.102	0.126	0.121	0.098	0.109	0.052	0.096	0.114	0.105	0.122	0.127	0.125
Fe^{2+}	0.18	0.105	0.165	0.158	0.132	0.11	0.128	0.142	0.129	0.242	0.057	0.039	0.047	0.038	0.04	0.042
Mn^{2+}	0.004	0.004	0.007	0.005	0.005	0.005	0.004	0.007	0.005	0.006	0.003	0.001	0.004	0.003	0.004	0.003
Mg	0.724	0.719	0.685	0.683	0.689	0.686	0.676	0.677	0.683	0.723	0.793	0.785	0.792	0.781	0.781	0.794
Ca	0.793	0.816	0.814	0.836	0.839	0.831	0.841	0.847	0.858	0.75	0.739	0.751	0.741	0.738	0.719	0.729
Na	0.096	0.111	0.113	0.111	0.117	0.131	0.117	0.11	0.106	0.094	0.195	0.2	0.197	0.207	0.214	0.201
K	0	0	0	0.001	0	0	0	0	0	0.001	0.001	0.001	0.001	0.001	0.001	0
Sum Cat#	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Wo(Ca)	46.746	49.755	48.911	49.827	50.544	51.092	51.109	50.865	51.37	43.74	46.494	47.678	46.915	47.418	46.684	46.616
En(Mg)	42.63	43.865	41.167	40.747	41.528	42.172	41.114	40.606	40.901	42.145	49.912	49.84	50.139	50.17	50.715	50.731
Fs(Fe^{2+})	10.624	6.381	9.922	9.427	7.927	6.737	7.777	8.53	7.729	14.114	3.594	2.482	2.946	2.412	2.601	2.653
XMg	0.801	0.873	0.806	0.812	0.84	0.862	0.841	0.826	0.841	0.749	0.933	0.953	0.945	0.954	0.951	0.95

A6.2. Major-element composition of clinopyroxene in xenoliths and clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 6 oxygens

Label	44_f_136	44_f_137	44_g_138	44_g_139	46_b_168	46_b_169	46_d_175	46_d_176	46_e_177	46_e_178	46_i_184	46_i_185	46_i_186	CAT-18_a_00	CAT-18_a_00	CAT-18_a_00
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Rock type	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	H metasom	high Mg ecl	high Mg ecl	high Mg ecl
Rock microst.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
SiO_2	54.01	54.33	54.5	53.66	54.85	53.38	55.31	54.89	54.25	55.17	55	54.51	54.9	54.79	54.89	55.03
TiO_2	0.3	0.22	0.26	0.22	0.21	0.23	0.24	0.21	0.22	0.19	0.23	0.25	0.23	0.41	0.36	0.37
Al_2O_3	2.95	2.84	3.02	3.11	3.48	3.68	3.92	3.72	3.66	2.91	3.67	2.81	3.13	6.55	6.4	6.48
Cr_2O_3	0.15	0.14	0.15	0.15	2.16	2.34	2.16	2.01	2.01	2.06	2.32	1.96	2.06	0.04	0.07	0.07
Fe_2O_3	4.57	3.92	3.84	4.58	1.61	2.63	1.28	1.72	2.29	0.39	2.02	1.35	1.51	3.61	3.74	3.65
FeO(c)	1.23	1.77	1.78	1.01	0.57	0	1.15	0.71	0	1.64	0.46	0.91	0.7	0	0	0
MnO	0.1	0.12	0.08	0.05	0.1	0.05	0.12	0	0.1	0.08	0.07	0.04	0.02	0.03	0.06	0.02
MgO	14.66	14.59	14.63	14.52	14.81	14.71	14.31	14.4	14.65	15.13	14.68	15.08	15.08	13.37	13.5	13.38
CaO	18.79	19.05	18.77	18.94	18.79	18.54	18.26	18.82	18.8	19.79	18.76	19.51	19.57	16.66	16.7	16.71
Na_2O	2.86	2.76	2.88	2.83	3.16	3.59	3.49	3.31	3.32	2.61	3.29	2.71	2.84	4.69	4.61	4.56
K_2O	0.01	0.02	0.02	0.01	0	0	0	0	0	0	0	0.01	0	0	0	0
Sum Ox%	99.62	99.76	99.92	99.07	99.73	99.15	100.24	99.78	99.3	99.97	100.5	99.13	100.04	100.16	100.33	100.27
Si	1.965	1.975	1.976	1.962	1.978	1.945	1.984	1.979	1.966	1.99	1.97	1.982	1.977	1.954	1.955	1.959
Ti	0.008	0.006	0.007	0.006	0.006	0.006	0.007	0.006	0.006	0.005	0.006	0.007	0.006	0.011	0.01	0.01
Al/Al IV	0.035	0.025	0.024	0.038	0.022	0.055	0.016	0.021	0.034	0.01	0.03	0.018	0.023	0.046	0.045	0.041
Al VI	0.092	0.097	0.105	0.096	0.126	0.103	0.15	0.137	0.122	0.113	0.125	0.103	0.11	0.229	0.223	0.231
Cr	0.004	0.004	0.004	0.004	0.061	0.068	0.061	0.057	0.058	0.059	0.066	0.056	0.059	0.001	0.002	0.002
Fe^{3+}	0.125	0.107	0.105	0.126	0.044	0.072	0.035	0.047	0.062	0.011	0.055	0.037	0.041	0.097	0.1	0.098
Fe^{2+}	0.037	0.054	0.054	0.031	0.017	0	0.034	0.021	0	0.05	0.014	0.028	0.021	0	0	0
Mn^{2+}	0.003	0.004	0.002	0.001	0.003	0.002	0.004	0	0.003	0.002	0.002	0.001	0.001	0.001	0.002	0.001
Mg	0.795	0.791	0.791	0.792	0.796	0.799	0.765	0.774	0.792	0.813	0.784	0.817	0.809	0.71	0.717	0.71
Ca	0.732	0.742	0.729	0.742	0.726	0.724	0.702	0.727	0.73	0.764	0.72	0.76	0.755	0.637	0.637	0.637
Na	0.202	0.194	0.202	0.201	0.221	0.254	0.243	0.231	0.233	0.183	0.228	0.191	0.199	0.324	0.318	0.315
K	0.001	0.001	0.001	0	0	0	0	0	0	0	0	0	0	0	0	0
Sum Cat#	4	4	4	4	4	4.027	4	4	4.006	4	4	4	4	4.01	4.009	4.003
Wo(Ca)	46.802	46.774	46.331	47.433	47.161	47.538	46.75	47.768	47.98	46.981	47.454	47.356	47.625	47.259	47.075	47.313
En(Mg)	50.806	49.839	50.247	50.592	51.73	52.462	50.956	50.835	52.02	49.976	51.64	50.927	51.053	52.741	52.925	52.687
Fs(Fe^{2+})	2.392	3.387	3.422	1.974	1.109	0	2.294	1.397	0	3.043	0.906	1.716	1.322	0	0	0
XMg	0.955	0.936	0.936	0.962	0.979	1	0.957	0.973	1	0.943	0.983	0.967	0.975	1	1	1

A6.2. Major-element composition of clinopyroxene in xenoliths and clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 6 oxygens

Label	CAT-18_b_00	CAT-18_b_01	CAT-18_c_01	CAT-18_a_00	CAT-18_a_00	CAT-18_b_01	CAT-18_b_01	CAT-18_c_01	CAT-34_b_03	CAT-34_b_03	CAT-34_c_04	CAT-34_b_03	CAT-34_b_03	CAT-34_c_04	CAT-41_d_09	CAT-41_d_09
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Rock type	high Mg ecl	high Mg ecl	high Mg ecl	high Mg ecl	high Mg ecl	high Mg ecl	high Mg ecl	high Mg ecl	low Mg ecl	low Mg ecl	low Mg ecl	low Mg ecl	low Mg ecl	low Mg ecl	low Mg ecl	low Mg ecl
Rock microst.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Grain size	coarse	coarse	coarse	fine	fine	fine	fine	fine	coarse	coarse	coarse	fine	fine	fine	coarse	coarse
SiO_2	54.89	54.91	54.95	54.43	53.77	53.62	53.22	53.82	54.73	55.9	55.71	53.24	52.37	52.97	55.22	57.75
TiO_2	0.42	0.39	0.4	0.34	0.37	0.31	0.31	0.36	0.67	0.3	0.28	0.49	0.71	0.59	0.27	0.29
Al_2O_3	6.2	6.15	5.73	4.26	4.4	4.68	4.67	4.75	11.23	12.02	11.77	8.5	9.12	9.05	10.55	11.17
Cr_2O_3	0.1	0.1	0.2	0.1	0.09	0.08	0.12	0.11	0.11	0.1	0.08	0.11	0.06	0.15	0.08	0.06
Fe_2O_3	3.63	3.61	3.65	2.65	4.21	4.34	4.03	4.5	2.01	0.76	1.39	4.16	4.52	4	4.93	2.51
FeO(c)	0	0	0	1.16	0	0.41	0.27	0	1.99	2.08	1.53	0.14	0.43	1	0.04	1.98
MnO	0.01	0.03	0.09	0.1	0.12	0.15	0.1	0.1	0.02	0.04	0.02	0.08	0.12	0.04	0.03	0.06
MgO	13.42	13.85	14	14.7	14.59	14.34	14.55	14.38	9.6	9.2	9.37	11.85	11.33	11.24	9.63	10.25
CaO	16.64	16.92	17.62	20.07	20.37	19.91	19.95	20.01	13.88	13.62	13.81	18.31	18.37	17.65	13.69	13.54
Na_2O	4.83	4.61	4.2	2.63	2.87	2.75	2.6	2.92	6.28	6.69	6.65	4.16	4.09	4.35	6.79	6.83
K_2O	0	0.01	0	0	0	0	0	0.01	0.02	0.04	0.04	0	0	0	0	0
Sum Ox%	100.13	100.59	100.84	100.45	100.78	100.59	99.82	100.95	100.52	100.75	100.66	101.04	101.12	101.04	101.24	104.44
Si	1.959	1.952	1.952	1.955	1.93	1.929	1.926	1.927	1.936	1.961	1.957	1.895	1.869	1.889	1.939	1.961
Ti	0.011	0.01	0.011	0.009	0.01	0.008	0.009	0.01	0.018	0.008	0.007	0.013	0.019	0.016	0.007	0.007
Al/Al IV	0.041	0.048	0.048	0.045	0.07	0.071	0.074	0.073	0.064	0.039	0.043	0.105	0.131	0.111	0.061	0.039
Al VI	0.22	0.21	0.192	0.136	0.116	0.127	0.126	0.128	0.403	0.457	0.444	0.252	0.253	0.269	0.376	0.408
Cr	0.003	0.003	0.006	0.003	0.003	0.002	0.003	0.003	0.003	0.003	0.002	0.003	0.002	0.004	0.002	0.002
Fe^{3+}	0.098	0.097	0.098	0.072	0.114	0.117	0.11	0.121	0.053	0.02	0.037	0.111	0.121	0.107	0.13	0.064
Fe^{2+}	0	0	0	0.035	0	0.012	0.008	0	0.059	0.061	0.045	0.004	0.013	0.03	0.001	0.056
Mn^{2+}	0	0.001	0.003	0.003	0.004	0.004	0.003	0.003	0.001	0.001	0.001	0.002	0.004	0.001	0.001	0.002
Mg	0.714	0.734	0.741	0.787	0.781	0.769	0.785	0.767	0.506	0.481	0.49	0.629	0.603	0.597	0.504	0.519
Ca	0.636	0.645	0.67	0.772	0.783	0.767	0.774	0.768	0.526	0.512	0.52	0.698	0.703	0.674	0.515	0.493
Na	0.334	0.318	0.289	0.183	0.2	0.192	0.183	0.202	0.43	0.455	0.452	0.287	0.283	0.301	0.462	0.449
K	0	0	0	0	0	0	0	0	0.001	0.002	0.002	0	0	0	0	0
Sum Cat#	4.016	4.018	4.01	4	4.009	4	4	4.002	4	4	4	4	4	4	4	4
Wo(Ca)	47.134	46.757	47.487	48.441	50.076	49.56	49.377	50.012	48.208	48.562	49.263	52.457	53.285	51.805	50.475	46.138
En(Mg)	52.867	53.243	52.513	49.37	49.924	49.635	50.101	49.988	46.403	45.652	46.468	47.22	45.733	45.902	49.411	48.599
Fs(Fe^{2+})	0	0	0	2.189	0	0.805	0.522	0	5.388	5.786	4.269	0.324	0.982	2.293	0.114	5.263
XMg	1	1	1	0.958	1	0.984	0.99	1	0.896	0.888	0.916	0.993	0.979	0.952	0.998	0.902

A6.2. Major-element composition of clinopyroxene in xenoliths and clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 6 oxygens

Label	CAT-41_d_09	CAT-41_e_09	CAT-41_g_09	CAT-41_g_09	CAT-26_e_09	CAT-26_e_10	CAT-26_f_11	CAT-26_f_12	CAT-26_f_13	13_a_005	13_a_006	13_b_012	13_b_013	13_b_014	13_e_026	13_e_027
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Rock type	low Mg ecl	low Mg ecl	low Mg ecl	low Mg ecl	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px
Rock microst.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
SiO_2	54.9	54.8	55.16	54.8	54.53	54.99	55.02	54.76	54.52	52.86	53.33	54.07	53.97	53.76	53.98	54.14
TiO_2	0.27	0.43	0.42	0.45	0.14	0.1	0.15	0.12	0.12	0.34	0.3	0.32	0.28	0.25	0.3	0.29
Al_2O_3	10.44	10.23	10	9.64	2.3	2.23	2.76	2.31	2.49	2.04	2.16	2.11	2.01	2.14	2.07	1.96
Cr_2O_3	0.06	0.06	0.11	0.08	0.07	0.07	0.07	0.07	0.11	0.17	0.21	0.19	0.19	0.18	0.19	0.21
Fe_2O_3	4.59	5.24	5	5.12	2.22	2.24	0.78	0.45	3.28	3.03	2.66	0.64	2.35	1.93	2	1.08
FeO(c)	0.22	0	0	0	1.21	1.27	2.75	2.9	0.54	0.42	0.55	2.2	0.83	1.13	1.12	1.96
MnO	0.09	0.08	0.01	0.06	0.08	0.06	0.08	0.09	0.07	0.05	0.01	0.1	0.04	0.05	0.09	0
MgO	9.77	9.5	9.66	9.92	15.94	16.2	15.95	15.82	16.03	16.99	17.3	16.89	17.18	16.97	17.13	16.94
CaO	13.61	13.51	13.56	13.78	21.48	21.26	20.95	21.07	21.01	21.61	21.47	21.36	21.46	21.46	21.32	21.48
Na_2O	6.61	6.88	6.91	6.81	1.75	1.81	1.68	1.6	1.98	1.07	1.09	1.1	1.22	1.2	1.23	1.13
K_2O	0.03	0.01	0	0.01	0	0	0.01	0	0	0.03	0.03	0.02	0.05	0.01	0.02	0.03
Sum Ox%	100.58	100.75	100.83	100.67	99.71	100.25	100.2	99.18	100.15	98.62	99.12	99.01	99.57	99.09	99.45	99.23
Si	1.941	1.937	1.946	1.941	1.977	1.982	1.985	1.996	1.967	1.941	1.945	1.974	1.959	1.961	1.961	1.973
Ti	0.007	0.011	0.011	0.012	0.004	0.003	0.004	0.003	0.003	0.009	0.008	0.009	0.008	0.007	0.008	0.008
Al/Al IV	0.059	0.063	0.054	0.059	0.023	0.018	0.015	0.004	0.033	0.059	0.055	0.026	0.041	0.039	0.039	0.027
Al VI	0.376	0.364	0.362	0.343	0.076	0.076	0.102	0.096	0.073	0.029	0.038	0.064	0.044	0.053	0.05	0.057
Cr	0.002	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.003	0.005	0.006	0.005	0.005	0.005	0.005	0.006
Fe^{3+}	0.122	0.14	0.133	0.137	0.061	0.061	0.021	0.012	0.089	0.084	0.073	0.018	0.064	0.053	0.055	0.03
Fe^{2+}	0.007	0	0	0	0.037	0.038	0.083	0.088	0.016	0.013	0.017	0.067	0.025	0.035	0.034	0.06
Mn^{2+}	0.003	0.002	0	0.002	0.002	0.002	0.002	0.003	0.002	0.002	0	0.003	0.001	0.001	0.003	0
Mg	0.515	0.501	0.508	0.524	0.861	0.87	0.858	0.859	0.862	0.93	0.94	0.919	0.929	0.922	0.928	0.92
Ca	0.515	0.512	0.513	0.523	0.834	0.821	0.81	0.823	0.812	0.85	0.839	0.836	0.835	0.839	0.83	0.839
Na	0.453	0.472	0.473	0.467	0.123	0.127	0.118	0.113	0.139	0.076	0.077	0.078	0.086	0.085	0.087	0.08
K	0.001	0	0	0	0	0	0.001	0	0	0.002	0.001	0.001	0.002	0	0.001	0.001
Sum Cat#	4	4.003	4.003	4.01	4	4	4	4	4	4	4	4	4	4	4	4
Wo(Ca)	49.716	50.552	50.219	49.968	48.167	47.46	46.264	46.48	48.04	47.406	46.699	45.861	46.648	46.71	46.316	46.125
En(Mg)	49.649	49.448	49.781	50.032	49.719	50.322	49.002	48.529	51.005	51.872	52.365	50.447	51.943	51.365	51.78	50.59
Fs(Fe^{2+})	0.635	0	0	0	2.114	2.218	4.734	4.991	0.955	0.722	0.936	3.692	1.409	1.925	1.904	3.285
XMg	0.987	1	1	1	0.959	0.958	0.912	0.907	0.982	0.986	0.982	0.932	0.974	0.964	0.965	0.939

A6.2. Major-element composition of clinopyroxene in xenoliths and clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 6 oxygens

Label	13_e_028	13_f_029	13_f_030	13_f_031	13_h_039	13_i_038	13_i_040	13_i_041	13_i_042	1-f-151	1-f-152	1-f-153	1-f-154	1-f-155	1-f-156	1-f-157
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Rock type	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.
Rock microst.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst
Grain size	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
SiO_2	54.19	53.23	53.82	54.04	53.84	53.74	53.4	54.11	54.22	53.42	55.1	55.35	56.25	52.9	53.02	52.57
TiO_2	0.33	0.32	0.28	0.3	0.29	0.31	0.33	0.31	0.35	0.27	0.2	0.27	0.23	0.24	0.26	0.3
Al_2O_3	2.06	2.03	2.08	2.01	2.09	2.1	2.03	2.04	2.11	2.58	2.69	2.67	2.78	2.63	2.69	2.67
Cr_2O_3	0.19	0.22	0.18	0.18	0.23	0.19	0.2	0.18	0.19	0.48	0.55	0.54	0.54	0.49	0.46	0.46
Fe_2O_3	0.7	1	2.34	2.8	0.74	1.5	1.71	0.8	1.01	4.82	2.61	2.56	0.05	4.31	3.94	4.48
FeO(c)	2.18	1.94	0.88	0.51	2.3	1.55	1.38	2.12	2.01	0.35	2.36	2.47	4.7	0.52	1.25	0.39
MnO	0.03	0.06	0.01	0.05	0	0.05	0.06	0.01	0.06	0.13	0.14	0.1	0.13	0.15	0.21	0.13
MgO	17.07	16.76	17.13	17.3	16.88	16.93	16.87	16.95	17.14	20.23	20.13	20.33	19.97	20.21	20.04	20.15
CaO	21.26	20.6	21.53	21.38	21.25	21.42	21.33	21.44	21.19	14.49	14.48	14.55	14.3	14.04	13.94	13.98
Na_2O	1.1	1.21	1.19	1.3	1.06	1.13	1.13	1.09	1.15	1.93	1.94	1.9	1.87	1.88	1.84	1.88
K_2O	0.05	0.02	0.02	0.03	0.04	0.03	0.03	0.04	0.02	0.02	0.04	0.05	0.02	0.03	0.02	0.02
Sum Ox%	99.15	97.39	99.48	99.9	98.71	98.96	98.46	99.09	99.45	98.71	100.25	100.78	100.84	97.4	97.66	97.02
Si	1.974	1.974	1.956	1.954	1.972	1.963	1.961	1.974	1.97	1.934	1.963	1.962	1.992	1.937	1.94	1.933
Ti	0.009	0.009	0.008	0.008	0.008	0.009	0.009	0.008	0.01	0.007	0.005	0.007	0.006	0.006	0.007	0.008
Al/Al IV	0.026	0.026	0.044	0.046	0.028	0.037	0.039	0.026	0.03	0.066	0.037	0.038	0.008	0.063	0.06	0.067
Al VI	0.063	0.062	0.045	0.04	0.062	0.054	0.049	0.061	0.06	0.043	0.076	0.073	0.108	0.051	0.056	0.048
Cr	0.005	0.006	0.005	0.005	0.007	0.006	0.006	0.005	0.006	0.014	0.016	0.015	0.015	0.014	0.013	0.013
Fe^{3+}	0.019	0.028	0.064	0.076	0.02	0.041	0.047	0.022	0.028	0.131	0.07	0.068	0.001	0.119	0.109	0.124
Fe^{2+}	0.066	0.06	0.027	0.016	0.07	0.047	0.042	0.065	0.061	0.01	0.07	0.073	0.139	0.016	0.038	0.012
Mn^{2+}	0.001	0.002	0	0.002	0	0.002	0.002	0	0.002	0.004	0.004	0.003	0.004	0.005	0.007	0.004
Mg	0.927	0.926	0.928	0.932	0.921	0.922	0.923	0.921	0.928	1.091	1.069	1.074	1.054	1.103	1.093	1.104
Ca	0.83	0.818	0.838	0.828	0.834	0.839	0.839	0.838	0.825	0.562	0.553	0.553	0.543	0.551	0.546	0.551
Na	0.077	0.087	0.084	0.091	0.075	0.08	0.08	0.077	0.081	0.136	0.134	0.131	0.128	0.133	0.131	0.134
K	0.002	0.001	0.001	0.001	0.002	0.001	0.002	0.002	0.001	0.001	0.002	0.002	0.001	0.001	0.001	0.001
Sum Cat#	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Wo(Ca)	45.525	45.337	46.746	46.639	45.681	46.383	46.499	45.935	45.468	33.778	32.666	32.511	31.254	32.993	32.58	33.035
En(Mg)	50.84	51.326	51.761	52.486	50.465	51.002	51.161	50.514	51.166	65.594	63.179	63.188	60.723	66.056	65.147	66.251
Fs(Fe^{2+})	3.635	3.336	1.493	0.875	3.854	2.615	2.341	3.551	3.367	0.628	4.155	4.301	8.023	0.951	2.273	0.714
XMg	0.933	0.939	0.972	0.984	0.929	0.951	0.956	0.934	0.938	0.991	0.938	0.936	0.883	0.986	0.966	0.989

A6.2. Major-element composition of clinopyroxene in xenoliths and clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 6 oxygens

Label	1-h-158	CAT-86_a_06	CAT-86_a_07	CAT-86_b_07	CAT-86_b_07	CAT-86_d_08	CAT-86_d_08	CAT-86_d_07	CAT-94_c_10	CAT-94_c_10	CAT-94_c_11	CAT-94_d_11	CAT-94_a_10	CAT-94_a_10	CAT-94_e_11	CAT-94_f_12
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Rock type	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.
Rock microst.	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst
Grain size	coarse	coarse	coarse	coarse	coarse	coarse	fine	fine	coarse	coarse	coarse	coarse	fine	fine	fine	fine
SiO_2	53.02	54.48	54.91	54.94	54.89	54.77	55.07	54.74	54.3	54.97	54.67	54.53	53.8	54.04	53.6	54.47
TiO_2	0.27	0.48	0.27	0.27	0.25	0.29	0.31	0.38	0.39	0.32	0.33	0.32	0.43	0.45	0.45	0.33
Al_2O_3	2.57	1.23	2.66	2.59	2.62	2.69	2.92	0.34	3.12	3.01	3.05	3.06	1.69	0.68	0.94	0.75
Cr_2O_3	0.51	0.85	0.5	0.56	0.48	0.55	0.63	0.46	0.5	0.43	0.49	0.46	0.53	0.51	0.6	0.48
Fe_2O_3	3.75	2.16	3.53	4.47	3.21	2.64	2.24	2.16	4.73	1.42	2.64	3.46	2.54	3.23	2.85	4.11
FeO(c)	1.14	2.27	1.61	0.79	2.06	2.26	2.2	3.49	1.04	3.85	2.66	1.94	3.63	2.26	2.34	1.81
MnO	0.11	0.11	0.15	0.12	0.14	0.09	0.13	0.14	0.12	0.13	0.1	0.18	0.21	0.09	0.14	0.16
MgO	20.14	17.31	20.2	20.18	20.15	20.13	16.9	17.33	18.32	18.49	18.24	18.34	15.97	16.24	16.39	16.49
CaO	14	20.27	14.65	14.81	14.7	14.85	17.77	21.35	15.17	14.95	15.24	15.46	19.29	21.84	21.28	21.42
Na_2O	1.82	1.36	2.02	2.16	1.91	1.82	2.35	0.85	2.57	2.13	2.34	2.33	1.66	1.23	1.19	1.43
K_2O	0.03	0.02	0.01	0.02	0.02	0.01	0	0	0.03	0.02	0.01	0.02	0	0.01	0	0
Sum Ox%	97.38	100.55	100.49	100.9	100.43	100.11	100.52	101.24	100.28	99.73	99.78	100.1	99.74	100.58	99.78	101.45
Si	1.943	1.967	1.953	1.946	1.955	1.956	1.973	1.976	1.943	1.977	1.965	1.955	1.968	1.965	1.962	1.962
Ti	0.007	0.013	0.007	0.007	0.007	0.008	0.008	0.01	0.01	0.009	0.009	0.009	0.012	0.012	0.012	0.009
Al/Al IV	0.057	0.033	0.047	0.054	0.045	0.044	0.027	0.015	0.057	0.023	0.035	0.045	0.032	0.029	0.038	0.032
Al VI	0.055	0.02	0.064	0.054	0.065	0.069	0.096	0	0.075	0.104	0.095	0.084	0.041	0	0.002	0
Cr	0.015	0.024	0.014	0.016	0.013	0.016	0.018	0.013	0.014	0.012	0.014	0.013	0.015	0.015	0.017	0.014
Fe^{3+}	0.104	0.059	0.094	0.119	0.086	0.071	0.06	0.059	0.127	0.039	0.071	0.093	0.07	0.088	0.079	0.111
Fe^{2+}	0.035	0.068	0.048	0.023	0.061	0.068	0.066	0.105	0.031	0.116	0.08	0.058	0.111	0.069	0.072	0.054
Mn^{2+}	0.003	0.004	0.004	0.004	0.004	0.003	0.004	0.004	0.004	0.004	0.003	0.006	0.006	0.003	0.004	0.005
Mg	1.1	0.932	1.071	1.065	1.07	1.071	0.902	0.932	0.977	0.991	0.977	0.98	0.871	0.88	0.894	0.886
Ca	0.55	0.784	0.558	0.562	0.561	0.568	0.682	0.826	0.582	0.576	0.587	0.594	0.756	0.851	0.834	0.827
Na	0.13	0.095	0.139	0.148	0.132	0.126	0.163	0.059	0.179	0.148	0.163	0.162	0.118	0.087	0.085	0.1
K	0.002	0.001	0	0.001	0.001	0.001	0	0	0.001	0.001	0	0.001	0	0	0	0
Sum Cat#	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Wo(Ca)	32.627	43.941	33.295	34.043	33.159	33.284	41.338	44.311	36.584	34.225	35.705	36.376	43.506	47.273	46.347	46.796
En(Mg)	65.306	52.221	63.854	64.546	63.22	62.758	54.672	50.031	61.453	58.889	59.433	60.052	50.099	48.906	49.671	50.122
Fs(Fe^{2+})	2.067	3.839	2.851	1.411	3.621	3.958	3.99	5.658	1.963	6.886	4.862	3.572	6.395	3.822	3.982	3.082
XMg	0.969	0.932	0.957	0.979	0.946	0.941	0.932	0.898	0.969	0.895	0.924	0.944	0.887	0.928	0.926	0.942

A6.2. Major-element composition of clinopyroxene in xenoliths and clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 6 oxygens

Label	CAT-94_d_11	CAT-95_a_05	CAT-95_a_05	CAT-95_c_05	CAT-95_c_05	CAT-97_a_05	CAT-97_a_05	CAT-97_b_05	CAT-97_b_06	CAT-97_d_06	CAT-97_d_06	CAT-97_d_06	20A_b_066	20A_b_067	20A_c_008	20A_c_009
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Rock type	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.
Rock microst.	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst
Grain size	fine	coarse	coarse	fine	fine	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
SiO_2	54.88	54.98	54.89	53.87	51.08	54.49	54.49	54.64	54.83	54.58	54.77	54.76	54.13	53.93	54.34	54.35
TiO_2	0.34	0.26	0.3	0.48	0.82	0.51	0.51	0.44	0.52	0.54	0.5	0.47	0.37	0.32	0.3	0.21
Al_2O_3	3.05	2.97	2.92	2.3	5.09	3.12	3.12	3.03	3.07	3.07	3.17	3.05	3.59	3.68	3.56	2.3
Cr_2O_3	0.4	0.62	0.63	0.62	0.56	0.52	0.52	0.59	0.53	0.42	0.39	0.42	0.09	0.05	0.06	0.08
Fe_2O_3	3.39	1.86	3.05	2.58	6.26	2.33	2.33	4.01	3.48	2.66	2.58	3.07	5.7	6.58	3.17	0.26
FeO(c)	2.22	3.34	2.07	2.7	0	3.21	3.21	1.56	2.11	2.94	3.32	2.95	0.97	0.18	2.89	5.1
MnO	0.15	0.08	0.17	0.17	0.09	0.11	0.11	0.16	0.13	0.11	0.15	0.14	0.14	0.1	0.08	0.1
MgO	18.28	18.74	18.75	16.89	20.32	16.98	16.98	17.1	17.37	16.84	16.88	16.95	14.53	14.55	14	15.43
CaO	15.27	14.94	14.85	17.8	8.29	16.33	16.33	16.34	16.29	16.37	16.14	16.27	17.17	17.2	16.84	18.72
Na_2O	2.45	2.16	2.4	1.95	5.04	2.39	2.39	2.7	2.56	2.53	2.52	2.53	3.46	3.56	3.39	1.83
K_2O	0.02	0.01	0.03	0	0.19	0.02	0.02	0.02	0.03	0	0	0.01	0	0.01	0.01	0
Sum Ox%	100.45	99.96	100.06	99.37	97.73	100	100	100.59	100.92	100.08	100.43	100.62	100.16	100.13	98.65	98.38
Si	1.961	1.971	1.964	1.962	1.865	1.965	1.965	1.956	1.956	1.966	1.967	1.964	1.956	1.948	1.991	2.005
Ti	0.009	0.007	0.008	0.013	0.023	0.014	0.014	0.012	0.014	0.015	0.014	0.013	0.01	0.009	0.008	0.006
Al/Al IV	0.039	0.029	0.036	0.038	0.135	0.035	0.035	0.044	0.044	0.034	0.033	0.036	0.044	0.052	0.009	0
Al VI	0.089	0.097	0.087	0.061	0.083	0.097	0.097	0.084	0.086	0.097	0.101	0.093	0.109	0.104	0.145	0.1
Cr	0.011	0.018	0.018	0.018	0.016	0.015	0.015	0.017	0.015	0.012	0.011	0.012	0.003	0.001	0.002	0.002
Fe^{3+}	0.091	0.05	0.082	0.071	0.172	0.063	0.063	0.108	0.093	0.072	0.07	0.083	0.155	0.179	0.087	0.007
Fe^{2+}	0.066	0.1	0.062	0.082	0	0.097	0.097	0.047	0.063	0.089	0.1	0.089	0.029	0.005	0.089	0.157
Mn^{2+}	0.004	0.003	0.005	0.005	0.003	0.003	0.003	0.005	0.004	0.003	0.005	0.004	0.004	0.003	0.003	0.003
Mg	0.974	1.001	1	0.917	1.106	0.912	0.912	0.913	0.924	0.904	0.904	0.906	0.783	0.783	0.765	0.848
Ca	0.585	0.574	0.569	0.695	0.324	0.631	0.631	0.627	0.623	0.632	0.621	0.625	0.665	0.666	0.661	0.74
Na	0.169	0.15	0.167	0.138	0.356	0.167	0.167	0.187	0.177	0.177	0.176	0.176	0.243	0.249	0.241	0.131
K	0.001	0	0.001	0	0.009	0.001	0.001	0.001	0.001	0	0	0.001	0	0	0.001	0
Sum Cat#	4	4	4	4	4.092	4	4	4	4	4	4	4	4	4	4	4
Wo(Ca)	35.984	34.253	34.894	41.004	22.664	38.462	38.462	39.519	38.691	38.9	38.234	38.589	45.009	45.779	43.659	42.393
En(Mg)	59.929	59.761	61.305	54.139	77.336	55.642	55.642	57.534	57.393	55.649	55.629	55.941	53.008	53.848	50.496	48.589
Fs(Fe^{2+})	4.087	5.986	3.801	4.857	0	5.896	5.896	2.946	3.916	5.451	6.137	5.47	1.982	0.373	5.845	9.018
XMg	0.936	0.909	0.942	0.918	1	0.904	0.904	0.951	0.936	0.911	0.901	0.911	0.964	0.993	0.896	0.843

A6.2. Major-element composition of clinopyroxene in xenoliths and clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 6 oxygens

Label	20A_c_010	20A_c_011	20A_c_012	20A_c_068	20A_c_069	20A_d_070	20A_d_071	20A_e_074	20A_e_075	20A_f_076	20A_f_077	20A_f_078	20A_f_079	20A_g_013	20A_g_014	20B_a_001
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Rock type	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.
Rock microst.	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst
Grain size	coarse	coarse	coarse	coarse	coarse	fine	fine	fine	fine	fine	fine	fine	fine	fine	fine	coarse
SiO_2	54.15	53.61	54.08	53.51	53.41	54.83	53.55	52.52	54.4	53.79	54.34	53.64	54.26	54.46	54.25	52.86
TiO_2	0.22	0.42	0.46	0.31	0.34	0.64	0.41	1.14	0.39	0.34	0.29	0.38	0.28	0.46	0.44	0.32
Al_2O_3	1.96	2.07	2.27	3.64	3.47	0.84	0.91	2.53	2.78	3.6	3.51	2.57	3.59	2.1	1.61	3.77
Cr_2O_3	0.09	0.07	0.09	0.07	0.07	0.73	0.62	1.09	0.08	0.11	0.07	0.05	0.04	0.1	0.09	0.07
Fe_2O_3	1.21	0.79	0.72	5.74	5.03	2.01	4.8	3.06	3.59	5.39	5.51	6.11	6.48	2.45	3.53	6.34
FeO(c)	4.07	4.3	4.09	0.65	1.2	2.2	0	1.86	2.57	1.18	1.26	0	0.37	2.92	1.88	0.34
MnO	0.15	0.13	0.14	0.09	0.09	0.23	0.11	0.11	0.13	0.13	0.11	0.09	0.07	0.1	0.06	0.13
MgO	15.64	16.07	16.66	14.44	14.17	18.51	18.7	17.24	15.68	14.32	14.37	16.32	14.62	16.55	16.89	14.36
CaO	19.22	18.85	18.83	16.8	16.64	20.78	20.95	19.45	18.95	17.24	17.45	19.11	17.46	19.96	20.83	16.98
Na_2O	1.77	1.57	1.51	3.51	3.51	0.87	1.09	1.34	2.26	3.38	3.43	2.36	3.49	1.61	1.41	3.38
K_2O	0	0	0.01	0	0.01	0.01	0	0	0.01	0	0	0.05	0.03	0	0	0
Sum Ox%	98.5	97.87	98.86	98.76	97.95	101.65	101.13	100.35	100.82	99.48	100.35	100.68	100.7	100.72	100.99	98.57
Si	1.996	1.988	1.981	1.957	1.97	1.958	1.925	1.904	1.96	1.958	1.961	1.932	1.95	1.964	1.954	1.941
Ti	0.006	0.012	0.013	0.009	0.009	0.017	0.011	0.031	0.011	0.009	0.008	0.01	0.008	0.013	0.012	0.009
Al/Al IV	0.004	0.012	0.019	0.043	0.03	0.035	0.039	0.096	0.04	0.042	0.039	0.068	0.05	0.036	0.046	0.059
Al VI	0.082	0.078	0.079	0.114	0.121	0	0	0.013	0.078	0.112	0.111	0.042	0.102	0.054	0.022	0.104
Cr	0.003	0.002	0.003	0.002	0.002	0.021	0.018	0.031	0.002	0.003	0.002	0.002	0.001	0.003	0.002	0.002
Fe^{3+}	0.034	0.022	0.02	0.158	0.14	0.054	0.13	0.084	0.097	0.148	0.15	0.166	0.175	0.067	0.096	0.175
Fe^{2+}	0.125	0.133	0.125	0.02	0.037	0.066	0	0.057	0.077	0.036	0.038	0	0.011	0.088	0.056	0.01
Mn^{2+}	0.005	0.004	0.004	0.003	0.003	0.007	0.003	0.003	0.004	0.004	0.003	0.003	0.002	0.003	0.002	0.004
Mg	0.86	0.888	0.91	0.787	0.779	0.986	1.002	0.932	0.842	0.777	0.773	0.876	0.783	0.89	0.907	0.786
Ca	0.759	0.749	0.739	0.658	0.658	0.795	0.807	0.755	0.731	0.672	0.675	0.738	0.672	0.771	0.804	0.668
Na	0.127	0.113	0.107	0.249	0.251	0.06	0.076	0.094	0.158	0.239	0.24	0.165	0.243	0.112	0.098	0.241
K	0	0	0	0	0	0.001	0	0	0	0	0	0.002	0.001	0	0	0
Sum Cat#	4	4	4	4	4	4	4.009	4	4	4	4	4.003	4	4	4	4
Wo(Ca)	43.522	42.302	41.657	44.936	44.625	43.063	44.612	43.319	44.311	45.259	45.407	45.707	45.829	44.096	45.487	45.615
En(Mg)	49.288	50.164	51.279	53.716	52.853	53.376	55.388	53.438	51.003	52.322	52.044	54.293	53.404	50.861	51.317	53.668
Fs(Fe^{2+})	7.191	7.534	7.064	1.348	2.522	3.562	0	3.243	4.686	2.419	2.55	0	0.768	5.043	3.196	0.716
XMg	0.873	0.869	0.879	0.976	0.954	0.937	1	0.943	0.916	0.956	0.953	1	0.986	0.91	0.941	0.987

A6.2. Major-element composition of clinopyroxene in xenoliths and clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 6 oxygens

Label	20B_a_003	20B_a_005	20B_a_006	20B_b_007	20B_b_008	20B_b_009	20B_c_010	20B_c_013	20B_c_014	20B_d_015	20B_d_016	20B_d_017	20B_e_018	20B_e_019	20B_e_020	20B_f_026
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
Rock type	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.
Rock microst.	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst	cpx megacryst
Grain size	coarse	fine	fine	coarse	fine	fine	coarse	coarse	coarse	fine	fine	coarse	fine	fine	fine	fine
SiO_2	55.23	54.08	53.3	54	53.54	53.18	54.82	54.45	53.76	51.84	52.67	52.63	50.5	52.71	51.74	52.4
TiO_2	0.33	0.59	0.63	0.36	0.79	0.94	0.34	0.36	0.42	1.04	0.98	1.22	1.13	1.01	1.12	0.62
Al_2O_3	3.61	1.03	1.56	3.6	1.41	2.31	3.62	3.71	2.18	3.13	2.97	3.09	3.55	2.79	3.32	1.83
Cr_2O_3	0.05	0.85	0.6	0.07	1.44	0.84	0.08	0.04	0.01	1.08	1.04	0.96	2.09	1.18	1.43	0.81
Fe_2O_3	3.92	1.86	2.43	4.81	2.89	0.91	2.53	3.78	4.7	1.95	1.6	1.84	3.5	3.09	2.37	4.64
FeO(c)	2.83	2.88	2.22	1.69	2.16	3.7	3.74	2.83	1.52	2.74	3.12	3.07	1.59	2.18	2.57	0.7
MnO	0.14	0.2	0.17	0.11	0.21	0.11	0.12	0.04	0.17	0.18	0.16	0.13	0.21	0.23	0.16	0.23
MgO	14.25	18.66	18.14	14	18.82	17.66	13.92	14.05	15.81	16.58	16.71	16.87	16.59	17.91	16.71	18.98
CaO	17.17	18.06	18.8	17.04	17.31	18.83	17	17.06	19.13	19.31	19.2	19.07	17.72	17.91	18.32	18.06
Na_2O	3.43	1.24	1.18	3.51	1.43	1.08	3.31	3.38	2.11	1.22	1.32	1.36	1.58	1.43	1.48	1.15
K_2O	0.02	0	0	0.01	0	0	0.02	0.01	0.16	0.01	0.02	0	0	0	0.01	0
Sum Ox%	100.98	99.45	99.04	99.19	100	99.56	99.52	99.71	99.97	99.09	99.8	100.24	98.46	100.45	99.23	99.4
Si	1.981	1.968	1.949	1.97	1.939	1.938	1.994	1.977	1.955	1.905	1.92	1.91	1.869	1.905	1.897	1.909
Ti	0.009	0.016	0.017	0.01	0.022	0.026	0.009	0.01	0.012	0.029	0.027	0.033	0.032	0.027	0.031	0.017
Al/Al IV	0.019	0.032	0.051	0.03	0.06	0.062	0.006	0.023	0.045	0.095	0.08	0.09	0.131	0.095	0.103	0.078
Al VI	0.134	0.012	0.016	0.125	0	0.037	0.15	0.136	0.049	0.04	0.047	0.042	0.023	0.023	0.04	0
Cr	0.002	0.024	0.017	0.002	0.041	0.024	0.002	0.001	0	0.031	0.03	0.028	0.061	0.034	0.042	0.023
Fe^{3+}	0.106	0.051	0.067	0.132	0.079	0.025	0.069	0.103	0.129	0.054	0.044	0.05	0.097	0.084	0.065	0.127
Fe^{2+}	0.085	0.088	0.068	0.051	0.065	0.113	0.114	0.086	0.046	0.084	0.095	0.093	0.049	0.066	0.079	0.021
Mn^{2+}	0.004	0.006	0.005	0.004	0.007	0.003	0.004	0.001	0.005	0.006	0.005	0.004	0.006	0.007	0.005	0.007
Mg	0.762	1.012	0.989	0.762	1.016	0.96	0.755	0.76	0.857	0.908	0.908	0.913	0.915	0.965	0.913	1.031
Ca	0.66	0.704	0.736	0.666	0.671	0.736	0.663	0.664	0.746	0.76	0.75	0.741	0.702	0.693	0.72	0.705
Na	0.239	0.087	0.084	0.248	0.1	0.076	0.234	0.238	0.149	0.087	0.093	0.096	0.113	0.1	0.105	0.081
K	0.001	0	0	0	0	0	0.001	0	0.007	0.001	0.001	0	0	0	0	0
Sum Cat#	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Wo(Ca)	43.796	39.035	41.069	45.037	38.314	40.685	43.276	43.948	45.21	43.377	42.776	42.436	42.146	40.223	42.045	40.123
En(Mg)	50.567	56.106	55.144	51.483	57.961	53.084	49.292	50.361	51.99	51.812	51.792	52.233	54.902	55.953	53.357	58.67
Fs(Fe^{2+})	5.637	4.86	3.787	3.48	3.725	6.232	7.432	5.691	2.8	4.812	5.432	5.331	2.951	3.824	4.598	1.207
XMg	0.9	0.92	0.936	0.937	0.94	0.895	0.869	0.898	0.949	0.915	0.905	0.907	0.949	0.936	0.921	0.98

A6.2. Major-element composition of clinopyroxene in xenoliths and clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 6 oxygens

Label	20B_f_027
Kimberlite	Cat115
Rock type	cpx meg.
Rock microst.	cpx megacryst
Grain size	fine
SiO_2	52.75
TiO_2	0.94
Al_2O_3	2.17
Cr_2O_3	1.07
Fe_2O_3	2.54
FeO(c)	2.39
MnO	0.2
MgO	17.59
CaO	19
Na_2O	1.21
K_2O	0
Sum Ox%	99.86
Si	1.92
Ti	0.026
Al/Al IV	0.08
Al VI	0.013
Cr	0.031
Fe^{3+}	0.07
Fe^{2+}	0.073
Mn^{2+}	0.006
Mg	0.955
Ca	0.741
Na	0.086
K	0
Sum Cat#	4
Wo(Ca)	41.906
En(Mg)	53.977
Fs(Fe^{2+})	4.117
XMg	0.929

A6.2. Major-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 12 oxygens

Analysis	30A_j_124	30A_j_125	30A_j_126	30A_l_127	30A_l_128	30b-a-28	30b-a-29	30b-a-30	30b-a-31	30b-c-32	30b-c-33	30b-d-50	30b-l-65
Rock	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz
Rock microst.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
zone	core	core	core	core	core	core	core	core	core	core	core	core	core
garnet type	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9
SiO_2	41.96	41.48	42.02	41.38	41.08	41.89	41.27	41.53	41.78	41.35	41.08	41.66	41.24
TiO_2	0.27	0.34	0.29	0.35	0.38	0.22	0.22	0.26	0.23	0.18	0.25	0.23	0.27
Al_2O_3	21.30	21.04	21.02	21.24	21.16	20.79	20.57	20.56	20.76	20.51	20.77	20.70	20.79
Cr_2O_3	3.16	3.18	3.00	3.09	3.12	3.70	3.65	3.76	3.78	3.88	3.93	3.78	3.91
$Fe_2O_{3(c)}$	2.61	2.29	1.79	2.84	3.37	0.00	1.10	0.23	0.00	1.35	0.99	1.82	2.41
FeO	6.03	5.99	6.52	5.55	5.14	7.60	6.97	7.51	7.81	6.77	6.95	6.65	6.25
MnO	0.48	0.47	0.47	0.37	0.48	0.41	0.46	0.38	0.36	0.45	0.44	0.44	0.60
MgO	21.56	21.24	21.33	21.46	21.41	20.06	20.29	20.18	20.04	20.42	20.16	20.57	20.38
CaO	4.28	4.36	4.29	4.38	4.44	4.66	4.64	4.70	4.66	4.68	4.71	4.88	4.96
Total	101.65	100.38	100.72	100.66	100.56	99.31	99.18	99.11	99.43	99.59	99.28	100.74	100.82
Si	2.947	2.95	2.976	2.932	2.917	3.013	2.979	2.998	3.006	2.974	2.964	2.964	2.938
Ti	0.014	0.018	0.015	0.018	0.020	0.012	0.012	0.014	0.012	0.010	0.014	0.012	0.014
Al/Al ^{IV}	0.053	0.050	0.024	0.068	0.083	0.000	0.021	0.002	0.000	0.026	0.036	0.036	0.062
Al ^{VI}	1.711	1.713	1.730	1.706	1.688	1.762	1.729	1.747	1.761	1.713	1.730	1.700	1.684
Cr	0.175	0.179	0.168	0.173	0.175	0.210	0.208	0.215	0.215	0.221	0.224	0.213	0.220
Fe^{3+}	0.138	0.122	0.095	0.151	0.180	0.000	0.060	0.012	0.000	0.073	0.054	0.098	0.129
Fe^{2+}	0.354	0.356	0.386	0.329	0.305	0.457	0.421	0.453	0.470	0.407	0.419	0.396	0.372
Mn^{2+}	0.029	0.028	0.028	0.022	0.029	0.025	0.028	0.023	0.022	0.027	0.027	0.027	0.036
Mg	2.257	2.251	2.252	2.267	2.266	2.151	2.183	2.171	2.149	2.189	2.168	2.182	2.165
Ca	0.322	0.332	0.326	0.332	0.338	0.359	0.359	0.364	0.359	0.361	0.364	0.372	0.379
Prp	76.2	75.8	75.3	76.8	77.1	71.9	73.0	72.1	71.6	73.4	72.8	73.3	73.3
Alm	12.0	12.0	12.9	11.1	10.4	15.3	14.1	15.1	15.7	13.7	14.1	13.3	12.6
Sps	1.0	1.0	0.9	0.8	1.0	0.8	0.9	0.8	0.7	0.9	0.9	0.9	1.2
Adr	6.8	6.0	4.7	7.4	8.7	0.0	3.0	0.6	0.0	3.6	2.7	4.8	6.3
Uvt	8.6	8.8	8.4	8.5	8.5	10.6	10.4	10.8	10.8	10.9	11.1	10.5	10.8
Grs	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.7	1.1	0.0	0.0	0.0	0.0

A6.2. Major-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 12 oxygens

Analysis	30b-l-66	30b-l-67	31_i_100	31_i_101	31_i_102	31_i_103	31_n_117	31_n_118	31_n_119	34_g_023	34_g_024	34_g_025	34_j_028
Rock	grt-Lhz	grt-Lhz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr
Rock microst.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
zone	core	core	rim	rim	core	core	core	core	rim	core	core	core	core
garnet type	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9
SiO_2	41.43	41.40	41.46	41.56	41.23	41.13	41.26	41.39	41.16	41.70	41.52	41.39	41.83
TiO_2	0.27	0.25	0.15	0.13	0.14	0.16	0.16	0.18	0.17	0.13	0.20	0.16	0.10
Al_2O_3	20.70	20.50	20.67	20.16	20.46	20.43	20.31	20.58	20.17	19.47	19.47	19.58	19.53
Cr_2O_3	4.02	3.92	3.98	3.88	3.93	4.05	4.09	3.96	4.11	5.43	5.44	5.43	5.51
$Fe_2O_{3(c)}$	2.06	2.15	0.75	0.66	1.63	1.57	1.65	1.29	1.67	0.12	0.22	0.52	0.24
FeO	6.79	6.68	8.44	8.52	7.83	7.78	8.01	8.10	7.88	7.48	7.36	7.10	8.03
MnO	0.43	0.49	0.49	0.53	0.49	0.52	0.43	0.43	0.43	0.46	0.44	0.39	0.49
MgO	20.32	20.41	19.17	19.16	19.33	19.25	19.36	19.37	19.35	19.73	19.75	19.79	19.61
CaO	4.95	4.82	5.16	5.17	5.19	5.24	5.09	5.16	5.12	5.35	5.32	5.37	5.18
Total	100.97	100.61	100.28	99.76	100.21	100.14	100.36	100.46	100.05	99.87	99.72	99.72	100.52
Si	2.949	2.956	2.982	3.005	2.969	2.965	2.969	2.972	2.971	3.008	2.999	2.989	3.005
Ti	0.014	0.013	0.008	0.007	0.007	0.009	0.009	0.010	0.009	0.007	0.011	0.009	0.006
Al/Al ^{IV}	0.051	0.044	0.018	0.000	0.031	0.035	0.031	0.028	0.029	0.000	0.001	0.011	0.000
Al ^{VI}	1.686	1.681	1.734	1.717	1.705	1.701	1.692	1.714	1.686	1.655	1.657	1.655	1.653
Cr	0.226	0.221	0.226	0.222	0.224	0.231	0.233	0.225	0.234	0.310	0.311	0.310	0.313
Fe^{3+}	0.110	0.116	0.041	0.036	0.088	0.085	0.089	0.070	0.091	0.006	0.012	0.028	0.013
Fe^{2+}	0.404	0.399	0.507	0.515	0.472	0.469	0.482	0.486	0.476	0.451	0.444	0.429	0.482
Mn^{2+}	0.026	0.029	0.030	0.032	0.030	0.032	0.026	0.026	0.026	0.028	0.027	0.024	0.030
Mg	2.156	2.172	2.055	2.065	2.074	2.068	2.077	2.073	2.081	2.121	2.127	2.130	2.100
Ca	0.377	0.369	0.398	0.400	0.400	0.405	0.393	0.397	0.396	0.414	0.412	0.415	0.398
Prp	72.8	73.2	68.7	68.5	69.7	69.5	69.8	69.5	69.9	70.4	70.7	71.0	69.7
Alm	13.6	13.4	17.0	17.1	15.8	15.8	16.2	16.3	16.0	15.0	14.8	14.3	16.0
Sps	0.9	1.0	1.0	1.1	1.0	1.1	0.9	0.9	0.9	0.9	0.9	0.8	1.0
Adr	5.4	5.7	2.0	1.8	4.4	4.2	4.4	3.5	4.5	0.3	0.6	1.4	0.6
Uvt	11.1	10.9	11.3	11.2	11.0	11.4	11.5	11.1	11.6	15.7	15.6	15.5	15.8
Grs	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

A6.2. Major-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 12 oxygens

Analysis	34_j_029	34_j_030	34_j_031	34_j_039	34_j_040	34_j_041	37_a_001	37_a_003	37_a_004	37_a_008	37_a_009	37_a_013	37_a_073
Rock	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr
Rock microst.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
zone	core	core	core	core	core	core	core	core	core	core	core	core	core
garnet type	G9	G9	G9	G9	G9	G9	G10	G10	G10	G10	G10	G10	G10
SiO_2	41.40	41.97	41.71	41.19	41.50	41.11	41.10	41.04	40.70	41.05	40.65	41.28	40.38
TiO_2	0.10	0.12	0.14	0.15	0.08	0.09	0.30	0.37	0.31	0.35	0.34	0.36	0.34
Al_2O_3	19.44	19.62	19.26	19.46	19.45	19.57	17.09	17.71	17.54	17.05	17.22	18.04	16.99
Cr_2O_3	5.68	5.53	5.59	5.56	5.73	5.41	8.53	7.64	7.82	8.51	8.37	6.91	8.25
$Fe_2O_{3(c)}$	0.30	0.04	0.02	0.42	0.10	1.45	2.66	2.28	2.55	1.75	2.69	1.81	1.64
FeO	8.00	8.24	8.07	7.49	7.95	7.01	5.53	5.79	5.26	6.26	5.63	6.20	6.10
MnO	0.44	0.45	0.34	0.42	0.54	0.46	0.45	0.49	0.42	0.40	0.49	0.38	0.45
MgO	19.37	19.57	19.55	19.51	19.44	19.80	20.61	20.77	20.74	20.54	20.39	20.45	19.89
CaO	5.17	5.24	5.27	5.23	5.11	5.04	5.23	4.76	4.91	4.79	5.03	5.19	5.13
Total	99.91	100.77	99.93	99.43	99.90	99.94	101.50	100.84	100.25	100.70	100.80	100.62	99.18
Si	2.995	3.008	3.013	2.989	3.001	2.968	2.948	2.951	2.943	2.965	2.936	2.97	2.962
Ti	0.005	0.006	0.008	0.008	0.004	0.005	0.016	0.020	0.017	0.019	0.018	0.020	0.019
Al/Al^{IV}	0.005	0.000	0.000	0.011	0.000	0.032	0.052	0.049	0.057	0.035	0.064	0.030	0.038
Al^{VI}	1.653	1.657	1.639	1.653	1.657	1.634	1.392	1.452	1.438	1.416	1.403	1.499	1.431
Cr	0.325	0.313	0.319	0.319	0.327	0.309	0.484	0.434	0.447	0.486	0.478	0.393	0.479
Fe^{3+}	0.016	0.002	0.001	0.023	0.005	0.079	0.144	0.123	0.139	0.095	0.146	0.098	0.091
Fe^{2+}	0.484	0.494	0.487	0.455	0.481	0.424	0.332	0.348	0.318	0.378	0.340	0.373	0.374
Mn^{2+}	0.027	0.027	0.021	0.026	0.033	0.028	0.027	0.030	0.026	0.025	0.030	0.023	0.028
Mg	2.088	2.090	2.104	2.110	2.096	2.131	2.203	2.226	2.236	2.211	2.195	2.193	2.175
Ca	0.401	0.403	0.408	0.407	0.396	0.390	0.402	0.367	0.380	0.370	0.389	0.400	0.403
Prp	69.6	69.4	69.7	70.4	69.7	71.7	74.3	74.9	75.5	74.1	74.3	73.4	73.0
Alm	16.1	16.4	16.1	15.2	16.0	14.2	11.2	11.7	10.7	12.7	11.5	12.5	12.6
Sps	0.9	0.9	0.7	0.9	1.1	1.0	0.9	1.0	0.9	0.8	1.0	0.8	0.9
Adr	0.8	0.1	0.1	1.2	0.3	3.9	7.0	6.1	6.8	4.7	7.1	4.9	4.5
Uvt	16.2	15.8	16.2	15.9	16.4	15.2	23.8	21.4	21.9	24.1	23.4	19.6	23.7
Grs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

A6.2. Major-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 12 oxygens

Analysis	37_a_074	37_a_075	37_a_076	37_b_113	37_b_114	37_b_115	40B_d_090	40B_d_091	40B_f_093	40B_f_094	40B_f_095	40B_f_096	40B_f_098
Rock	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz
Rock microst.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
zone	core	core	core	core	core	core	core	core	core	core	core	core	core
garnet type	G10	G10	G10	G10	G10	G10	G9	G9	G9	G9	G9	G9	G9
SiO_2	40.85	40.63	40.58	39.15	39.84	40.18	41.63	42.05	40.44	40.24	41.18	41.09	42.18
TiO_2	0.34	0.40	0.43	0.32	0.33	0.36	0.35	0.40	0.35	0.34	0.31	0.29	0.27
Al_2O_3	16.61	16.71	17.07	16.77	16.92	17.05	20.08	19.73	19.80	19.57	20.15	19.82	19.84
Cr_2O_3	8.58	8.65	7.56	8.81	8.66	8.50	4.52	4.31	4.44	4.56	4.58	4.60	4.63
$Fe_2O_{3(c)}$	0.97	1.05	1.04	4.59	3.43	2.71	1.79	1.20	3.41	3.75	2.07	2.46	0.62
FeO	6.75	6.53	6.42	3.70	4.79	5.23	6.08	6.80	4.82	4.65	5.80	5.57	7.04
MnO	0.48	0.48	0.41	0.53	0.40	0.53	0.35	0.40	0.33	0.29	0.35	0.44	0.38
MgO	20.07	19.88	19.07	20.47	20.47	20.18	21.30	21.38	21.32	21.34	21.10	21.05	21.06
CaO	4.79	5.06	6.30	4.99	4.90	5.18	4.44	4.15	4.30	4.25	4.49	4.59	4.45
Total	99.44	99.39	98.88	99.32	99.74	99.91	100.55	100.42	99.21	98.99	100.03	99.91	100.47
Si	2.99	2.977	2.987	2.874	2.909	2.929	2.964	2.996	2.92	2.914	2.948	2.949	3.006
Ti	0.019	0.022	0.024	0.018	0.018	0.020	0.019	0.022	0.019	0.019	0.017	0.016	0.014
Al/Al^{IV}	0.010	0.023	0.013	0.126	0.091	0.071	0.036	0.004	0.080	0.086	0.052	0.051	0.000
Al^{VI}	1.423	1.420	1.468	1.326	1.366	1.394	1.649	1.654	1.604	1.584	1.648	1.626	1.666
Cr	0.497	0.501	0.440	0.511	0.500	0.490	0.255	0.243	0.253	0.261	0.259	0.261	0.261
Fe^{3+}	0.053	0.058	0.058	0.253	0.189	0.148	0.096	0.064	0.185	0.204	0.112	0.133	0.033
Fe^{2+}	0.413	0.400	0.395	0.227	0.293	0.319	0.362	0.405	0.291	0.282	0.347	0.334	0.420
Mn^{2+}	0.030	0.030	0.026	0.033	0.024	0.033	0.021	0.024	0.020	0.018	0.021	0.027	0.023
Mg	2.190	2.172	2.093	2.240	2.227	2.192	2.261	2.271	2.294	2.303	2.252	2.251	2.237
Ca	0.375	0.397	0.497	0.393	0.383	0.404	0.338	0.317	0.333	0.329	0.345	0.353	0.340
Prp	72.8	72.4	69.5	77.4	76.1	74.4	75.8	75.3	78.1	78.5	75.9	75.9	74.1
Alm	13.7	13.3	13.1	7.9	10.0	10.8	12.1	13.4	9.9	9.6	11.7	11.3	13.9
Sps	1.0	1.0	0.9	1.1	0.8	1.1	0.7	0.8	0.7	0.6	0.7	0.9	0.8
Adr	2.7	2.9	2.9	12.0	9.1	7.2	4.8	3.2	9.0	9.9	5.5	6.5	1.7
Uvt	24.9	25.0	22.1	24.2	24.1	23.9	12.6	12.2	12.3	12.6	12.7	12.8	13.2
Grs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

A6.2. Major-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 12 oxygens

Analysis	40B_f_099	40B_h_102	40B_h_102	10_a_016	10_a_017	10_a_018	10_a_084	10_a_085	10_a_086	10_d_105	10_d_106	10_d_109	10_g_117
Rock	grt-Hz	grt-Hz	grt-Hz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz
Rock microst.	coarse	coarse	coarse	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared
zone	core	core	core	core	medium	rim	core	core	core	core	core	core	core
garnet type	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9
SiO_2	41.95	40.33	40.93	41.76	41.84	41.97	41.54	41.44	41.28	41.47	41.25	40.73	41.12
TiO_2	0.30	0.18	0.27	1.08	1.01	0.95	0.97	1.00	0.98	0.96	1.00	0.97	1.03
Al_2O_3	19.99	19.51	19.63	17.17	18.34	18.78	18.00	18.55	18.67	19.09	19.06	19.25	17.73
Cr_2O_3	4.60	4.14	4.07	6.55	5.52	4.57	5.30	4.89	4.79	4.53	4.46	4.25	5.73
$Fe_2O_{3(c)}$	1.81	1.37	0.68	0.15	0.33	0.73	0.42	0.39	1.35	0.71	1.19	1.90	0.19
FeO	6.10	5.23	6.39	7.11	7.28	6.66	6.82	7.03	6.22	6.93	6.46	5.71	7.30
MnO	0.39	0.34	0.27	0.39	0.33	0.36	0.30	0.38	0.26	0.29	0.33	0.26	0.24
MgO	21.46	20.62	20.68	20.25	20.46	21.03	20.66	20.44	20.81	20.60	20.67	20.89	20.04
CaO	4.44	4.73	4.43	5.70	5.35	5.11	5.15	5.16	5.21	5.08	5.14	4.98	5.34
Total	101.03	96.44	97.35	100.16	100.48	100.15	99.16	99.26	99.56	99.66	99.57	98.93	98.73
Si	2.972	2.981	3	3.019	3.004	3.007	3.014	3.003	2.98	2.989	2.976	2.952	3.008
Ti	0.016	0.010	0.015	0.059	0.055	0.051	0.053	0.054	0.053	0.052	0.054	0.053	0.057
Al/Al^{IV}	0.028	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.011	0.024	0.048	0.000
Al^{VI}	1.642	1.681	1.695	1.463	1.552	1.586	1.539	1.584	1.568	1.610	1.596	1.595	1.528
Cr	0.257	0.242	0.236	0.374	0.314	0.259	0.304	0.280	0.274	0.258	0.255	0.244	0.332
Fe^{3+}	0.097	0.076	0.037	0.008	0.018	0.039	0.023	0.021	0.073	0.038	0.065	0.104	0.010
Fe^{2+}	0.361	0.323	0.392	0.430	0.437	0.399	0.414	0.426	0.375	0.417	0.390	0.346	0.446
Mn^{2+}	0.023	0.021	0.017	0.024	0.020	0.022	0.019	0.023	0.016	0.018	0.020	0.016	0.015
Mg	2.267	2.272	2.260	2.182	2.190	2.245	2.234	2.207	2.239	2.213	2.223	2.256	2.185
Ca	0.337	0.375	0.348	0.441	0.412	0.392	0.401	0.400	0.403	0.392	0.397	0.387	0.419
Prp	75.9	76.0	74.9	70.9	71.6	73.4	72.8	72.2	73.8	72.8	73.4	75.1	71.3
Alm	12.1	10.8	13.0	14.0	14.3	13.0	13.5	13.9	12.4	13.7	12.9	11.5	14.6
Sps	0.8	0.7	0.6	0.8	0.7	0.7	0.6	0.8	0.5	0.6	0.7	0.5	0.5
Adr	4.8	3.8	1.9	0.4	0.9	2.0	1.2	1.1	3.7	2.0	3.3	5.2	0.5
Uvt	12.8	12.0	11.9	19.7	16.2	13.4	15.8	14.4	13.9	13.2	12.9	12.2	17.2
Grs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

A6.2. Major-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 12 oxygens

Analysis	10_g_118	10_g_119	12_d_086	12_d_087	12_d_088	12_j_097	12_j_098	12-d-139	12-e-140	12-g-129	12-g-130	24a-a-1	24a-a-2
Rock	grt-Lhz	grt-Lhz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz
Rock microst.	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared
zone	core	core	core	medium	rim	core	medium	core	core	core	core	core	core
garnet type	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9
SiO_2	41.29	40.93	41.33	41.32	41.15	40.85	40.79	40.21	39.85	40.95	40.75	40.59	40.21
TiO_2	0.97	0.98	0.99	0.99	1.13	1.21	1.22	1.10	1.16	1.22	1.22	0.36	0.44
Al_2O_3	18.34	18.44	15.50	15.59	15.60	15.31	15.49	15.67	16.19	15.98	15.96	16.26	16.26
Cr_2O_3	5.23	4.90	8.77	8.78	8.44	8.42	8.15	8.81	7.99	8.05	8.17	8.65	8.42
$Fe_2O_{3(c)}$	0.81	1.70	0.00	0.00	0.03	0.00	0.00	4.11	3.62	1.90	2.24	3.08	3.67
FeO	6.79	5.81	6.94	6.97	6.94	6.70	6.82	3.55	3.91	5.57	5.15	4.10	3.91
MnO	0.40	0.32	0.31	0.31	0.36	0.36	0.25	0.38	0.40	0.28	0.29	0.30	0.36
MgO	20.38	20.75	19.72	19.49	19.62	19.22	19.29	20.91	20.68	20.51	20.48	20.27	20.21
CaO	5.26	5.23	6.14	6.03	6.21	6.03	5.99	6.15	5.88	5.97	6.15	6.50	6.40
Total	99.47	99.06	99.71	99.47	99.48	98.10	98.00	100.87	99.69	100.44	100.40	100.11	99.87
Si	2.992	2.971	3.024	3.029	3.018	3.033	3.03	2.909	2.909	2.968	2.956	2.951	2.933
Ti	0.053	0.053	0.055	0.055	0.063	0.067	0.068	0.060	0.064	0.067	0.067	0.020	0.024
Al/Al^{IV}	0.008	0.029	0.000	0.000	0.000	0.000	0.000	0.091	0.091	0.032	0.044	0.049	0.067
Al^{VI}	1.559	1.548	1.337	1.347	1.348	1.340	1.356	1.244	1.303	1.333	1.320	1.344	1.331
Cr	0.300	0.281	0.507	0.509	0.489	0.495	0.479	0.504	0.461	0.461	0.468	0.497	0.485
Fe^{3+}	0.044	0.093	0.000	0.000	0.002	0.000	0.000	0.224	0.199	0.104	0.122	0.168	0.201
Fe^{2+}	0.411	0.353	0.425	0.427	0.426	0.416	0.424	0.214	0.239	0.338	0.312	0.249	0.239
Mn^{2+}	0.024	0.020	0.019	0.019	0.022	0.023	0.016	0.023	0.025	0.017	0.018	0.019	0.022
Mg	2.201	2.245	2.150	2.130	2.144	2.128	2.136	2.254	2.250	2.216	2.215	2.197	2.197
Ca	0.408	0.406	0.481	0.473	0.488	0.480	0.477	0.477	0.460	0.464	0.478	0.506	0.500
Prp	72.3	74.2	69.9	69.8	69.6	69.8	70.0	75.9	75.7	73.0	73.3	74.0	74.3
Alm	13.5	11.7	13.8	14.0	13.8	13.7	13.9	7.2	8.0	11.1	10.3	8.4	8.1
Sps	0.8	0.7	0.6	0.6	0.7	0.7	0.5	0.8	0.8	0.6	0.6	0.6	0.7
Adr	2.2	4.7	0.0	0.0	0.1	0.0	0.0	11.0	9.8	5.3	6.2	8.3	9.9
Uvt	15.3	14.2	26.7	26.6	25.7	26.0	25.2	24.8	22.8	23.5	23.7	24.5	23.8
Grs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

A6.2. Major-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 12 oxygens

Analysis	24a-a-3	24a-a-8	24a-b-10	24a-b-9	24a-d-17	24a-d-18	24a-e-19	24a-e-20	28_a_031	28_a_032	28_a_075	28_a_076	28_a_077
Rock	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz
Rock microst.	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared
zone	core	core	core	core	core	core	core	core	rim	core	medium	core	core
garnet type	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9
SiO_2	40.40	40.45	40.40	40.25	40.01	40.74	40.70	40.14	40.78	40.76	40.00	40.52	40.33
TiO_2	0.42	0.43	0.43	0.40	0.45	0.44	0.41	0.41	1.09	1.21	1.18	1.13	1.13
Al_2O_3	16.29	16.10	15.99	16.44	16.18	16.30	16.11	16.07	15.63	15.41	15.50	15.39	15.28
Cr_2O_3	8.44	8.33	8.45	8.41	8.45	8.57	8.66	8.68	8.17	8.36	8.25	8.32	8.50
$Fe_2O_{3(c)}$	3.43	2.78	2.46	3.63	4.17	2.49	3.12	3.85	1.52	1.19	2.65	1.63	2.20
FeO	4.00	4.57	4.74	3.76	3.50	4.88	4.73	3.56	6.05	6.31	4.76	6.01	5.41
MnO	0.30	0.35	0.24	0.23	0.36	0.28	0.34	0.31	0.27	0.28	0.29	0.32	0.39
MgO	20.30	20.09	20.07	20.47	20.34	20.06	20.07	20.35	20.10	19.82	20.11	19.75	19.92
CaO	6.39	6.27	6.19	6.25	6.34	6.40	6.39	6.42	5.94	6.17	6.25	6.19	6.19
Total	99.98	99.37	98.97	99.83	99.80	100.15	100.54	99.79	99.53	99.50	98.98	99.25	99.35
Si	2.941	2.963	2.97	2.931	2.921	2.963	2.955	2.93	2.987	2.992	2.948	2.983	2.967
Ti	0.023	0.024	0.024	0.022	0.025	0.024	0.023	0.023	0.060	0.067	0.066	0.063	0.062
Al/Al^{IV}	0.059	0.037	0.030	0.069	0.079	0.037	0.045	0.070	0.013	0.008	0.052	0.017	0.033
Al^{VI}	1.339	1.353	1.356	1.342	1.313	1.360	1.333	1.312	1.336	1.325	1.294	1.318	1.292
Cr	0.486	0.483	0.491	0.484	0.487	0.493	0.497	0.501	0.473	0.485	0.480	0.484	0.494
Fe^{3+}	0.188	0.153	0.136	0.199	0.229	0.136	0.171	0.212	0.084	0.065	0.147	0.090	0.122
Fe^{2+}	0.244	0.280	0.292	0.229	0.214	0.297	0.287	0.217	0.370	0.387	0.294	0.370	0.333
Mn^{2+}	0.019	0.022	0.015	0.014	0.022	0.017	0.021	0.019	0.016	0.017	0.018	0.020	0.024
Mg	2.203	2.193	2.199	2.222	2.213	2.175	2.172	2.214	2.194	2.169	2.209	2.167	2.184
Ca	0.498	0.492	0.487	0.488	0.496	0.498	0.497	0.502	0.466	0.485	0.493	0.488	0.488
Prp	74.3	73.4	73.5	75.3	75.1	72.8	73.0	75.0	72.0	70.9	73.3	71.1	72.1
Alm	8.2	9.4	9.7	7.8	7.3	9.9	9.6	7.4	12.2	12.7	9.7	12.2	11.0
Sps	0.6	0.7	0.5	0.5	0.8	0.6	0.7	0.6	0.5	0.6	0.6	0.7	0.8
Adr	9.2	7.6	6.8	9.7	11.1	6.8	8.4	10.3	4.3	3.4	7.4	4.6	6.2
Uvt	23.9	24.0	24.5	23.7	23.7	24.5	24.6	24.5	24.2	25.0	24.2	24.8	25.1
Grs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

A6.2. Major-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 12 oxygens

Analysis	28_a_101	28_a_102	28_a_103	28_b_38	28_b_39	28_b_40	28_e_48	28_e_49	28_f_054	28_f_055	28_h_005	28_h_006	28_h_058
Rock	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz
Rock microst.	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared
zone	core	core	core	rim	rim	core	core	core	core	core	rim	core	core
garnet type	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9
SiO_2	41.55	41.40	41.01	41.26	40.64	40.29	40.53	40.23	41.43	41.13	40.68	40.87	40.73
TiO_2	1.14	1.11	1.15	1.17	1.03	1.10	1.12	1.07	1.15	1.18	1.00	0.92	0.94
Al_2O_3	15.23	15.25	15.62	16.08	15.75	16.24	15.61	15.68	15.92	15.80	15.84	15.74	15.58
Cr_2O_3	8.66	8.37	8.12	7.95	8.38	7.76	8.59	8.45	8.04	7.94	8.38	8.60	8.57
$Fe_2O_{3(c)}$	0.00	0.29	0.00	0.55	1.63	2.84	2.01	1.58	0.17	0.75	3.16	2.52	1.22
FeO	7.42	7.24	7.19	6.73	5.71	4.87	5.29	5.62	7.18	6.62	4.30	4.98	5.95
MnO	0.34	0.30	0.30	0.29	0.36	0.29	0.32	0.23	0.30	0.27	0.29	0.27	0.23
MgO	19.48	19.71	19.34	20.07	19.97	20.55	20.24	19.89	19.79	19.95	20.88	20.55	19.99
CaO	6.25	6.11	5.96	5.93	6.14	5.76	6.09	6.06	6.11	6.09	6.04	6.10	6.04
Total	100.05	99.79	98.68	100.03	99.60	99.71	99.79	98.80	100.10	99.72	100.57	100.56	99.25
Si	3.036	3.031	3.029	3.003	2.976	2.939	2.963	2.969	3.017	3.005	2.944	2.962	2.991
Ti	0.063	0.061	0.064	0.064	0.057	0.061	0.062	0.059	0.063	0.065	0.054	0.050	0.052
Al/Al^{IV}	0.000	0.000	0.000	0.000	0.024	0.061	0.037	0.031	0.000	0.000	0.056	0.038	0.009
Al^{VI}	1.312	1.315	1.360	1.379	1.335	1.336	1.307	1.332	1.367	1.360	1.295	1.307	1.339
Cr	0.500	0.485	0.474	0.457	0.485	0.448	0.496	0.493	0.463	0.459	0.479	0.493	0.498
Fe^{3+}	0.000	0.016	0.000	0.030	0.090	0.156	0.111	0.088	0.009	0.041	0.172	0.137	0.068
Fe^{2+}	0.453	0.443	0.444	0.410	0.350	0.297	0.323	0.347	0.437	0.404	0.260	0.302	0.366
Mn^{2+}	0.021	0.019	0.019	0.018	0.022	0.018	0.020	0.015	0.019	0.016	0.018	0.017	0.015
Mg	2.121	2.151	2.129	2.177	2.179	2.235	2.205	2.188	2.148	2.172	2.252	2.220	2.188
Ca	0.489	0.480	0.471	0.462	0.482	0.451	0.477	0.479	0.477	0.477	0.468	0.474	0.475
Prp	68.8	69.6	69.5	71.0	71.9	74.5	72.9	72.3	69.7	70.8	75.1	73.7	71.9
Alm	14.7	14.3	14.5	13.4	11.5	9.9	10.7	11.4	14.2	13.2	8.7	10.0	12.0
Sps	0.7	0.6	0.6	0.6	0.7	0.6	0.7	0.5	0.6	0.5	0.6	0.6	0.5
Adr	0.0	0.9	0.0	1.6	4.6	7.8	5.6	4.4	0.5	2.1	8.6	6.9	3.5
Uvt	26.7	25.8	25.0	23.7	24.7	22.4	25.1	25.0	24.3	23.8	23.9	24.8	25.4
Grs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

A6.2. Major-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 12 oxygens

Analysis	28_h_059	28_h_083	28_h_084	32B_b_038	32B_b_039	32B_c_040	32B_c_041	32B_c_042	32B_f_055b	32B_f_056	32B_g_041	32B_g_042	32B_g_043
Rock	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz
Rock microst.	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared
zone	rim	core	rim	core	core	core	core	rim	rim	rim	?	?	?
garnet type	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9
SiO_2	41.40	40.18	40.24	41.68	40.74	39.55	40.33	39.25	40.43	40.44	41.20	41.40	41.23
TiO_2	0.98	0.95	0.96	0.47	0.43	0.88	0.89	1.01	1.02	1.08	1.06	0.96	0.96
Al_2O_3	15.49	15.49	15.69	20.04	20.34	15.58	15.88	15.89	15.77	15.99	15.55	15.71	15.59
Cr_2O_3	8.58	8.43	8.45	3.48	3.44	8.88	8.72	8.37	8.29	8.31	8.59	8.53	8.46
$Fe_2O_{3(c)}$	0.82	2.08	2.55	2.25	3.84	3.95	2.29	4.87	2.43	2.91	0.30	0.68	0.00
FeO	6.48	5.48	5.05	5.31	3.85	3.82	5.10	2.98	5.06	4.83	6.90	6.71	6.99
MnO	0.36	0.29	0.33	0.31	0.32	0.31	0.31	0.40	0.36	0.38	0.34	0.42	0.30
MgO	19.95	19.77	20.09	21.67	21.80	20.29	20.18	20.56	20.12	20.43	19.64	19.90	19.62
CaO	6.23	6.16	6.08	4.70	4.74	6.09	5.96	6.10	6.23	6.01	6.21	6.05	6.05
Total	100.28	98.83	99.44	99.90	99.50	99.35	99.67	99.42	99.71	100.37	99.79	100.36	99.18
Si	3.013	2.969	2.953	2.974	2.918	2.909	2.951	2.88	2.957	2.938	3.015	3.011	3.03
Ti	0.053	0.053	0.053	0.025	0.023	0.049	0.049	0.056	0.056	0.059	0.058	0.052	0.053
Al/Al^{IV}	0.000	0.031	0.047	0.026	0.082	0.091	0.049	0.120	0.043	0.062	0.000	0.000	0.000
Al^{VI}	1.329	1.318	1.310	1.659	1.634	1.259	1.321	1.254	1.317	1.308	1.341	1.347	1.350
Cr	0.494	0.492	0.490	0.197	0.195	0.516	0.504	0.486	0.480	0.477	0.497	0.490	0.491
Fe^{3+}	0.045	0.115	0.141	0.121	0.207	0.219	0.126	0.269	0.134	0.159	0.016	0.037	0.000
Fe^{2+}	0.394	0.338	0.310	0.317	0.230	0.235	0.312	0.183	0.309	0.293	0.422	0.408	0.429
Mn^{2+}	0.022	0.018	0.021	0.019	0.019	0.019	0.019	0.025	0.022	0.023	0.021	0.026	0.018
Mg	2.164	2.177	2.197	2.304	2.327	2.224	2.201	2.249	2.193	2.212	2.142	2.158	2.149
Ca	0.486	0.488	0.478	0.359	0.364	0.480	0.467	0.480	0.489	0.468	0.487	0.471	0.476
Prp	70.6	72.1	73.1	76.8	79.1	75.2	73.4	76.6	72.8	73.8	69.7	70.4	69.9
Alm	12.9	11.2	10.3	10.6	7.8	7.9	10.4	6.2	10.3	9.8	13.7	13.3	14.0
Sps	0.7	0.6	0.7	0.6	0.7	0.6	0.6	0.8	0.7	0.8	0.7	0.8	0.6
Adr	2.3	5.8	7.1	6.0	10.0	10.7	6.3	13.0	6.7	7.9	0.9	1.9	0.0
Uvt	25.7	24.9	24.6	9.8	9.5	25.3	25.2	23.5	24.1	23.8	26.0	25.5	25.9
Grs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

A6.2. Major-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 12 oxygens

Analysis	32B_g_044	32B_g_061	CAT-18_b_00	CAT-18_b_00	CAT-18_b_00	CAT-18_d_02	CAT-18_f_025	26_a_01	26_a_02	26_b_03	26_b_04	26_b_04b	CAT-34_a_02
Rock	grt-Hz	grt-Hz	high-Mg ecl	high-Mg ecl	high-Mg ecl	high-Mg ecl	high-Mg ecl	grt-px	grt-px	grt-px	grt-px	grt-px	low-Mg ecl
Rock microst.	sheared	sheared	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
zone	?	?	core	core	core	core	core	core	core	core	core	core	core
garnet type	G9	G9	G3	G3	G3	G3	G3	G3	G3	G3	G3	G3	G3
SiO_2	41.44	40.75	41.35	41.57	41.32	41.46	41.51	41.47	41.38	41.45	41.72	41.16	39.89
TiO_2	1.08	1.06	0.18	0.08	0.18	0.12	0.08	0.17	0.14	0.18	0.14	0.12	0.21
Al_2O_3	15.58	15.89	23.80	23.85	23.94	23.89	23.62	22.74	23.13	23.38	23.46	22.94	22.82
Cr_2O_3	8.36	8.21	0.07	0.09	0.08	0.04	0.05	0.18	0.12	0.17	0.16	0.15	0.11
$Fe_2O_{3(c)}$	0.78	2.01	2.00	1.60	2.07	2.18	1.66	0.93	1.43	0.18	0.90	1.22	1.25
FeO	6.49	5.40	9.62	10.12	9.55	9.70	10.00	12.06	11.67	12.49	12.02	11.43	14.51
MnO	0.27	0.30	0.35	0.35	0.37	0.39	0.37	0.41	0.35	0.39	0.27	0.29	0.34
MgO	20.19	20.22	19.98	19.71	19.93	19.93	19.87	17.85	17.93	17.58	18.07	18.02	11.26
CaO	6.06	6.19	3.19	3.29	3.22	3.18	3.05	4.25	4.38	4.30	4.31	4.29	10.13
Total	100.27	100.03	100.65	100.73	100.68	100.90	100.21	100.11	100.60	100.12	101.09	99.66	100.52
Si	3.012	2.968	2.936	2.951	2.932	2.937	2.958	2.992	2.97	2.988	2.976	2.977	2.954
Ti	0.059	0.058	0.010	0.004	0.010	0.007	0.004	0.009	0.008	0.010	0.008	0.007	0.012
Al/Al^{IV}	0.000	0.032	0.064	0.049	0.068	0.063	0.042	0.008	0.030	0.012	0.024	0.023	0.046
Al^{VI}	1.335	1.333	1.927	1.946	1.934	1.931	1.942	1.926	1.927	1.974	1.949	1.932	1.946
Cr	0.480	0.473	0.004	0.005	0.004	0.002	0.003	0.011	0.007	0.010	0.009	0.008	0.007
Fe^{3+}	0.042	0.110	0.107	0.085	0.110	0.116	0.089	0.051	0.078	0.010	0.049	0.067	0.070
Fe^{2+}	0.395	0.329	0.571	0.601	0.567	0.575	0.596	0.728	0.701	0.753	0.717	0.691	0.899
Mn^{2+}	0.017	0.018	0.021	0.021	0.022	0.023	0.023	0.025	0.021	0.024	0.016	0.018	0.021
Mg	2.187	2.195	2.114	2.085	2.108	2.104	2.111	1.920	1.919	1.888	1.922	1.942	1.243
Ca	0.472	0.483	0.242	0.250	0.245	0.241	0.233	0.329	0.337	0.332	0.329	0.332	0.803
Prp	71.2	72.5	71.7	70.5	71.7	71.5	71.3	64.0	64.4	63.0	64.4	65.1	41.9
Alm	12.9	10.9	19.4	20.3	19.3	19.5	20.1	24.2	23.5	25.1	24.0	23.2	30.3
Sps	0.5	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.8	0.5	0.6	0.7
Adr	2.2	5.6	5.2	4.2	5.4	5.6	4.4	2.5	3.8	0.5	2.4	3.3	3.4
Uvt	25.1	24.0	0.2	0.2	0.2	0.1	0.1	0.5	0.3	0.5	0.4	0.4	0.3
Grs	0.0	0.0	2.8	4.0	2.7	2.4	3.4	7.9	7.2	10.1	8.2	7.4	23.3

A6.2. Major-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 12 oxygens

Analysis	CAT-34_a_03	CAT-34_b_03	CAT-34_c_04	AT-34_c_04	CAT-34_f_04	46_a_085	46_b_086	46_b_089	46_c_087	46_c_088	46_f_096	13_a_001	13_a_003
Rock	low-Mg ecl	low-Mg ecl	low-Mg ecl	low-Mg ecl	low-Mg ecl	low-Mg ecl	low-Mg ecl	low-Mg ecl	low-Mg ecl	low-Mg ecl	low-Mg ecl	grt-px	grt-px
Rock microst.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
zone	core	core	core	core	core	core	core	core	core	core	core	core	core
garnet type	G3	G3	G3	G3	G3	G3	G3	G3	G3	G3	G3	G3	G3
SiO_2	39.64	40.02	54.31	40.06	39.82	39.79	39.58	39.69	39.45	39.41	39.88	40.54	40.61
TiO_2	0.22	0.22	0.25	0.20	0.18	0.19	0.14	0.14	0.14	0.15	0.13	0.95	1.03
Al_2O_3	22.71	22.73	11.40	22.66	22.70	22.60	22.43	22.40	22.55	22.29	22.40	20.86	20.79
Cr_2O_3	0.10	0.08	0.11	0.07	0.07	0.06	0.06	0.08	0.07	0.04	0.06	0.96	0.91
$Fe_2O_{3(c)}$	1.45	1.42	0.00	1.88	0.79	1.96	1.97	1.98	1.93	1.79	1.38	2.43	2.70
FeO	14.34	14.32	2.68	14.03	14.94	15.53	16.69	17.16	16.70	16.99	17.36	5.67	5.70
MnO	0.28	0.27	0.04	0.21	0.28	0.37	0.28	0.28	0.41	0.33	0.39	0.20	0.25
MgO	11.10	11.50	8.77	11.88	11.25	12.30	10.74	10.60	10.78	10.56	10.69	17.33	17.34
CaO	10.32	10.11	13.91	9.89	9.79	7.76	8.85	8.78	8.66	8.71	8.61	9.81	9.86
Total	100.24	100.67	91.47	100.89	99.93	100.57	100.74	101.12	100.88	100.36	100.95	98.76	99.19
Si	2.947	2.957	4.085	2.951	2.966	2.946	2.95	2.952	2.939	2.953	2.968	2.957	2.953
Ti	0.012	0.012	0.014	0.011	0.010	0.011	0.008	0.008	0.008	0.009	0.007	0.052	0.056
Al/Al^{IV}	0.053	0.043	0.000	0.049	0.034	0.054	0.050	0.048	0.061	0.047	0.032	0.043	0.047
Al^{VI}	1.936	1.936	1.010	1.918	1.959	1.919	1.920	1.916	1.919	1.921	1.933	1.750	1.734
Cr	0.006	0.005	0.007	0.004	0.004	0.003	0.004	0.005	0.004	0.002	0.004	0.056	0.053
Fe^{3+}	0.081	0.079	0.000	0.104	0.044	0.109	0.111	0.111	0.108	0.101	0.077	0.134	0.147
Fe^{2+}	0.892	0.885	0.168	0.864	0.931	0.962	1.040	1.067	1.040	1.065	1.080	0.346	0.346
Mn^{2+}	0.018	0.017	0.002	0.013	0.018	0.024	0.017	0.018	0.026	0.021	0.025	0.012	0.015
Mg	1.230	1.267	0.983	1.304	1.249	1.357	1.193	1.175	1.197	1.179	1.186	1.884	1.879
Ca	0.822	0.801	1.121	0.781	0.782	0.615	0.707	0.700	0.691	0.699	0.687	0.766	0.768
Prp	41.5	42.7	43.2	44.0	41.9	45.9	40.3	39.7	40.5	39.8	39.8	62.6	62.4
Alm	30.1	29.8	7.4	29.2	31.2	32.5	35.2	36.1	35.2	35.9	36.3	11.5	11.5
Sps	0.6	0.6	0.1	0.5	0.6	0.8	0.6	0.6	0.9	0.7	0.8	0.4	0.5
Adr	4.0	3.9	0.0	5.1	2.2	5.3	5.4	5.4	5.3	5.0	3.8	6.7	7.4
Uvt	0.3	0.2	0.6	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	2.8	2.6
Grs	23.5	22.9	48.6	21.0	23.8	15.3	18.3	18.0	17.9	18.5	19.1	16.0	15.5

A6.2. Major-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 12 oxygens

Analysis	13_a_004	13_a_007	13_a_008	13_a_009	13_b_010	13_b_011	13_c_015	13_c_016	13_c_017	13_c_018	13_c_019	13_c_020	13_d_023
Rock	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px
Rock microst.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
zone	rim	core	rim	rim	core	core	core	rim	rim	core	rim	rim	rim
garnet type	G3	G3	G3	G3	G3	G3	G3	G3	G3	G3	G3	G3	G3
SiO_2	40.99	40.54	40.98	40.73	40.95	40.66	40.63	40.92	40.96	40.78	41.01	41.09	41.18
TiO_2	1.01	1.00	0.97	0.98	0.97	0.93	0.90	0.94	0.95	0.97	0.99	0.94	0.96
Al_2O_3	21.13	21.26	20.72	20.66	21.13	21.18	21.04	21.20	21.38	20.75	21.17	21.18	20.46
Cr_2O_3	0.94	0.93	0.93	0.90	0.92	0.83	0.88	0.87	0.86	0.89	0.94	0.92	0.99
$Fe_2O_{3(c)}$	2.20	2.64	1.85	2.21	1.67	2.18	2.85	2.13	1.37	2.23	1.43	1.97	0.54
FeO	6.18	5.80	6.51	6.01	6.45	5.81	5.34	6.28	6.87	6.12	6.75	6.41	7.32
MnO	0.21	0.23	0.24	0.24	0.17	0.18	0.21	0.29	0.23	0.23	0.19	0.25	0.16
MgO	17.32	17.25	17.26	17.22	17.05	17.14	17.30	18.39	18.16	17.37	18.02	18.28	16.92
CaO	9.88	9.84	9.65	9.87	10.02	10.08	10.16	8.14	8.08	9.63	8.49	8.38	9.73
Total	99.86	99.50	99.12	98.81	99.32	98.98	99.31	99.16	98.86	98.96	98.97	99.43	98.27
Si	2.96	2.939	2.981	2.972	2.972	2.958	2.948	2.962	2.972	2.97	2.975	2.968	3.019
Ti	0.055	0.054	0.053	0.054	0.053	0.051	0.049	0.051	0.052	0.053	0.054	0.051	0.053
Al/Al^{IV}	0.040	0.061	0.019	0.028	0.028	0.042	0.052	0.038	0.028	0.030	0.025	0.032	0.000
Al^{VI}	1.757	1.755	1.758	1.748	1.779	1.774	1.747	1.770	1.800	1.751	1.785	1.770	1.768
Cr	0.053	0.053	0.054	0.052	0.053	0.048	0.051	0.050	0.049	0.051	0.054	0.053	0.057
Fe^{3+}	0.120	0.144	0.101	0.121	0.091	0.119	0.156	0.116	0.075	0.122	0.078	0.107	0.030
Fe^{2+}	0.373	0.351	0.396	0.367	0.391	0.353	0.324	0.380	0.417	0.373	0.409	0.387	0.449
Mn^{2+}	0.013	0.014	0.015	0.015	0.010	0.011	0.013	0.018	0.014	0.014	0.012	0.015	0.010
Mg	1.864	1.863	1.871	1.872	1.844	1.859	1.871	1.984	1.965	1.885	1.949	1.968	1.849
Ca	0.764	0.764	0.752	0.772	0.779	0.786	0.790	0.632	0.628	0.751	0.660	0.649	0.764
Prp	61.8	62.3	61.7	61.9	61.0	61.8	62.4	65.8	65.0	62.4	64.3	65.2	60.2
Alm	12.4	11.7	13.0	12.1	12.9	11.7	10.8	12.6	13.8	12.3	13.5	12.8	14.6
Sps	0.4	0.5	0.5	0.5	0.3	0.4	0.4	0.6	0.5	0.5	0.4	0.5	0.3
Adr	6.0	7.2	5.2	6.1	4.6	6.0	7.8	5.8	3.8	6.2	3.9	5.4	1.6
Uvt	2.7	2.7	2.7	2.6	2.7	2.4	2.5	2.5	2.5	2.6	2.7	2.7	3.0
Grs	16.6	15.7	16.9	16.7	18.5	17.7	16.0	12.6	14.5	16.1	15.1	13.4	20.3

A6.2. Major-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 12 oxygens

Analysis	13_d_024	13_d_025	13_g_032	13_g_033	13_h_034	13_h_035	13_h_036	13_h_037	18_a_001	18_a_002	18_a_066	18_a_067	18_a_068
Rock	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-ol-webs?	grt-ol-webs?	grt-ol-webs?	grt-ol-webs?	grt-ol-webs?
Rock microst.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
zone	core	rim	medium	core	core	rim	core	core	core	core	core	core	medium
garnet type	G3	G3	G3	G3	G3	G3	G3	G3	G9	G9	G9	G9	G9
SiO_2	40.96	40.66	41.00	41.45	41.19	40.92	41.17	41.01	40.27	40.64	40.15	40.73	40.46
TiO_2	0.92	0.97	1.03	0.95	1.06	0.97	0.97	1.06	0.07	0.10	0.09	0.11	0.05
Al_2O_3	20.66	20.58	20.83	20.49	20.63	20.47	20.81	20.85	22.10	22.13	22.34	21.80	22.09
Cr_2O_3	0.96	0.93	1.17	1.18	0.99	1.03	0.91	0.86	0.85	0.86	0.96	0.88	0.86
$Fe_2O_{3(c)}$	1.33	2.19	1.32	0.51	0.86	1.03	0.76	1.35	2.87	2.20	2.79	1.67	1.58
FeO	6.76	6.05	6.90	7.43	7.29	6.90	7.29	6.73	11.20	12.25	11.42	12.54	12.02
MnO	0.19	0.18	0.21	0.19	0.24	0.22	0.18	0.21	0.42	0.44	0.51	0.52	0.50
MgO	16.89	17.24	16.91	16.80	16.97	16.92	17.04	17.19	16.80	16.54	16.46	16.22	16.39
CaO	9.96	9.77	9.92	10.04	9.70	9.78	9.56	9.70	5.19	5.07	5.33	5.33	5.22
Total	98.64	98.57	99.29	99.04	98.95	98.24	98.70	98.96	99.77	100.24	100.05	99.80	99.17
Si	2.995	2.973	2.982	3.02	3.003	3.003	3.005	2.986	2.941	2.96	2.93	2.982	2.972
Ti	0.051	0.053	0.056	0.052	0.058	0.054	0.053	0.058	0.004	0.005	0.005	0.006	0.003
Al/Al^{IV}	0.005	0.027	0.018	0.000	0.000	0.000	0.000	0.014	0.059	0.040	0.070	0.018	0.028
Al^{VI}	1.775	1.746	1.766	1.759	1.773	1.771	1.790	1.774	1.844	1.860	1.851	1.863	1.885
Cr	0.055	0.054	0.067	0.068	0.057	0.060	0.053	0.050	0.049	0.049	0.055	0.051	0.050
Fe^{3+}	0.073	0.121	0.072	0.028	0.047	0.057	0.042	0.074	0.158	0.121	0.153	0.092	0.087
Fe^{2+}	0.413	0.370	0.420	0.453	0.445	0.424	0.445	0.410	0.684	0.746	0.697	0.767	0.738
Mn^{2+}	0.012	0.011	0.013	0.012	0.015	0.014	0.011	0.013	0.026	0.027	0.032	0.032	0.031
Mg	1.840	1.879	1.832	1.824	1.844	1.850	1.854	1.865	1.829	1.795	1.790	1.770	1.795
Ca	0.780	0.765	0.773	0.783	0.758	0.769	0.748	0.756	0.406	0.396	0.417	0.418	0.411
Prp	60.4	62.1	60.3	59.4	60.2	60.5	60.6	61.3	62.1	60.6	61.0	59.2	60.3
Alm	13.6	12.2	13.8	14.7	14.5	13.9	14.6	13.5	23.2	25.2	23.7	25.7	24.8
Sps	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.9	0.9	1.1	1.1	1.0
Adr	3.7	6.1	3.7	1.5	2.4	2.9	2.2	3.8	7.7	5.9	7.4	4.6	4.3
Uvt	2.8	2.7	3.4	3.6	3.0	3.1	2.7	2.5	2.4	2.4	2.7	2.5	2.5
Grs	19.0	16.4	18.3	20.5	19.4	19.1	19.6	18.5	3.7	5.0	4.1	6.9	7.0

A6.2. Major-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Oxides in wt%. Structural formula normalised to 12 oxygens

Analysis	18_d_009	18_d_012	18_f_015	18_f_016	18_h_021	18_h_022	18_h_067	18_h_068	18_h_069	18_h_070
Rock	grt-ol-webs?	grt-ol-webs?	grt-ol-webs?	grt-ol-webs?	grt-ol-webs?	grt-ol-webs?	grt-ol-webs?	grt-ol-webs?	grt-ol-webs?	grt-ol-webs?
Rock microst.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
zone	core	core	core	core	core	core	core	medium	core	core
garnet type	G9	G9	G9	G9	G9	G9	G9	G9	G9	G9
SiO_2	40.89	39.95	40.84	40.98	40.04	39.99	40.35	40.34	40.26	40.43
TiO_2	0.12	0.06	0.08	0.09	0.09	0.10	0.07	0.08	0.15	0.11
Al_2O_3	21.57	21.94	21.85	21.95	22.19	22.00	21.69	21.75	21.46	21.69
Cr_2O_3	0.98	1.03	0.94	0.90	0.95	0.95	0.93	0.95	0.95	0.95
$Fe_2O_{3(c)}$	0.85	3.28	1.43	0.93	3.06	3.13	2.22	2.44	2.13	1.49
FeO	13.34	11.26	12.66	13.14	11.39	11.24	11.94	11.82	12.15	12.67
MnO	0.42	0.47	0.55	0.48	0.47	0.49	0.47	0.49	0.52	0.54
MgO	15.98	16.44	16.35	16.19	16.47	16.48	16.30	16.42	16.14	16.05
CaO	5.26	5.30	5.11	5.16	5.26	5.31	5.35	5.25	5.33	5.16
Total	99.41	99.72	99.82	99.80	99.93	99.69	99.30	99.55	99.09	99.08
Si	3.007	2.929	2.987	2.998	2.927	2.93	2.968	2.96	2.972	2.982
Ti	0.007	0.003	0.005	0.005	0.005	0.006	0.004	0.005	0.008	0.006
Al/Al^{IV}	0.000	0.071	0.013	0.002	0.073	0.070	0.032	0.040	0.028	0.018
Al^{VI}	1.869	1.824	1.871	1.890	1.839	1.830	1.848	1.841	1.838	1.868
Cr	0.057	0.060	0.054	0.052	0.055	0.055	0.054	0.055	0.055	0.056
Fe^{3+}	0.047	0.181	0.079	0.051	0.168	0.173	0.123	0.135	0.118	0.083
Fe^{2+}	0.820	0.690	0.775	0.804	0.696	0.689	0.734	0.725	0.750	0.782
Mn^{2+}	0.026	0.029	0.034	0.029	0.029	0.030	0.029	0.030	0.033	0.034
Mg	1.752	1.796	1.783	1.765	1.794	1.800	1.787	1.796	1.776	1.765
Ca	0.415	0.417	0.400	0.404	0.412	0.417	0.421	0.413	0.422	0.408
Prp	58.1	61.3	59.6	58.8	61.2	61.3	60.1	60.6	59.6	59.1
Alm	27.2	23.5	25.9	26.8	23.8	23.5	24.7	24.5	25.2	26.2
Sps	0.9	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.1	1.1
Adr	2.4	8.7	3.9	2.6	8.1	8.4	6.0	6.6	5.8	4.1
Uvt	2.9	2.9	2.7	2.6	2.7	2.7	2.7	2.7	2.7	2.8
Grs	8.5	2.6	6.8	8.3	3.3	3.2	5.5	4.6	5.6	6.8

A6.2. Major-element composition of chromite found in mantle xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 4 oxygens

Label	10_a_090	10_a_091	10_g_120	10_g_121	10_g_122	11_A_001	11_A_002	11_A_003	11_b_004	11_b_005	11_b_006	11_b_007	12_d_089	12_d_090	12_d_091
Rock type	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	spl-Hz	spl-Hz	spl-Hz	spl-Hz	spl-Hz	spl-Hz	spl-Hz	grt-Hz	grt-Hz	grt-Hz
Occurrence	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	interstitial	interstitial	interstitial	interstitial	interstitial	interstitial	interstitial	garnet rim	garnet rim	garnet rim
Analysed area	core	rim	core	rim	rim	core	core	core	core	core	core	core	core	core	core
SiO_2	0.12	0.17	0.19	0.08	0.16	0.06	0	0.02	0.03	0	0.03	0.05	0.23	0.65	1
TiO_2	2.11	1.14	1.47	1.16	1.29	0.02	0.01	0.01	0.02	0.01	0.02	0	1.93	0.99	1.48
Al_2O_3	25.69	41.82	37.3	40.75	40.78	40.81	40.69	41.85	40.54	40.46	41.54	41.32	24.95	34.25	30.41
Cr_2O_3	35.02	21.69	25.68	22.61	23.2	25.58	25.86	25.02	25.58	25.69	25.02	25.22	38.44	26.74	33.5
$Fe_2O_{3(c)}$	5.71	4.75	5.32	5.17	4.57	3.12	3.14	2.89	3.86	4	3.34	3.01	4.09	10.98	3.41
FeO	14.32	11.23	12.09	11.21	11.48	13.55	13.67	13.52	13.2	13.34	13.27	13.71	12.98	5.12	13.29
V_2O_3	0.25	0.22	0.17	0.18	0.15	0.16	0.12	0.05	0.1	0.12	0.08	0.07	0.07	0.19	0.19
MnO	0.3	0.19	0.36	0.3	0.15	0.26	0.16	0.24	0.26	0.15	0.22	0.14	0.31	0.44	0.32
MgO	14.99	18.49	17.66	18.2	18.43	15.9	15.8	16	16.08	16.13	16.16	15.86	15.84	22.19	16.95
ZnO	0.05	0.02	0.02	0.09	0.05	0.24	0.24	0.31	0.2	0.21	0.29	0.33	0.02	0.03	0
NiO	0.06	0.02	0.06	0.07	0.02	0.16	0.18	0.14	0.27	0.1	0.22	0.13	0.1	0	0.13
Sum Ox%	98.62	99.74	100.32	99.81	100.28	99.86	99.87	100.06	100.12	100.19	100.2	99.84	98.97	101.59	100.67
Si	0.004	0.005	0.005	0.002	0.004	0.002	0	0.001	0.001	0	0.001	0.001	0.007	0.018	0.029
Ti	0.048	0.024	0.031	0.024	0.027	0	0	0	0	0	0	0	0.044	0.021	0.032
Al/Al IV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Al VI	0.919	1.365	1.238	1.337	1.331	1.356	1.353	1.382	1.344	1.341	1.371	1.371	0.887	1.11	1.035
Cr	0.841	0.475	0.572	0.498	0.508	0.57	0.577	0.554	0.569	0.571	0.554	0.561	0.917	0.581	0.765
Fe^{3+}	0.13	0.099	0.113	0.108	0.095	0.066	0.067	0.061	0.082	0.085	0.07	0.064	0.093	0.227	0.074
Fe^{2+}	0.364	0.26	0.285	0.261	0.266	0.32	0.323	0.317	0.311	0.314	0.311	0.323	0.327	0.118	0.321
V	0.006	0.005	0.004	0.004	0.003	0.004	0.003	0.001	0.002	0.003	0.002	0.002	0.002	0.004	0.004
Mn2+	0.008	0.005	0.009	0.007	0.004	0.006	0.004	0.006	0.006	0.004	0.005	0.003	0.008	0.01	0.008
Mg	0.678	0.763	0.742	0.755	0.76	0.668	0.665	0.668	0.674	0.676	0.674	0.665	0.712	0.91	0.729
Zn	0.001	0	0	0.002	0.001	0.005	0.005	0.006	0.004	0.004	0.006	0.007	0.001	0.001	0
Ni	0.001	0	0.001	0.002	0	0.004	0.004	0.003	0.006	0.002	0.005	0.003	0.002	0	0.003
Sum Cat#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
XCr	47.77	25.817	31.59	27.125	27.623	29.604	29.895	28.624	29.739	29.869	28.776	29.055	50.833	34.372	42.493
XFe^{2+}	34.9	25.417	27.749	25.672	25.899	32.359	32.683	32.152	31.54	31.698	31.544	32.67	31.491	11.469	30.543
YFe^{3+}	6.904	5.11	5.863	5.57	4.926	3.323	3.337	3.053	4.093	4.235	3.531	3.194	4.892	11.846	3.954
#Mg	0.65	0.75	0.72	0.74	0.74	0.68	0.67	0.68	0.68	0.68	0.68	0.67	0.69	0.89	0.69
#Cr	0.48	0.26	0.32	0.27	0.28	0.30	0.30	0.29	0.30	0.30	0.29	0.29	0.51	0.34	0.43

A6.2. Major-element composition of chromite found in mantle xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 4 oxygens

Label	15A-i-100	15A-m-109	15A-m-110	15A-m-111	24B_a_046	24B_a_047	24B_c_050	24B_d_051	24B_d_052	24B_e_057	24B_e_058	28_a_104	28_a_105	32B_g_045	32B_g_046
Rock type	MARID?	MARID?	MARID?	MARID?	MARID?	MARID?	MARID?	MARID?	MARID?	MARID?	MARID?	grt-Hz	grt-Hz	grt-Hz	grt-Hz
Occurrence	interstitial	interstitial	interstitial	interstitial	interstitial	interstitial	interstitial	interstitial	interstitial	interstitial	interstitial	garnet rim	garnet rim	garnet rim	garnet rim
Analysed area	core	core	core	core	rim	core	core	core	rim	rim	core	core	core	core	core
SiO_2	0.08	0.08	0.06	0.1	0.04	0.08	0.07	0.07	0.1	0.06	0.17	0.29	0.48	0.16	0.17
TiO_2	4.84	4.87	5.12	4.47	2.2	3.83	3.83	3.82	2.17	3.22	3.68	1.57	1.8	0.84	0.9
Al_2O_3	1.6	1.6	1.99	4.59	7.97	1.54	1.51	1.57	7.17	5.88	3.28	37.77	36.47	36.59	37.23
Cr_2O_3	31.07	32.1	32.71	37.2	45.36	42.99	42.59	43.47	49.11	49.27	44.09	25.29	25.89	27.78	26.82
$Fe_2O_{3(c)}$	29.24	28.1	26.04	20.97	14.49	19.33	19.54	19.25	11.85	10.82	16.73	4.43	4.22	5.18	5.08
FeO	26.92	26.72	25.84	24.65	16.91	23.76	23.3	24.03	19.13	18.48	20.1	11.93	13.23	9.94	10.44
V_2O_3	0.28	0.29	0.41	0.32	0.22	0.17	0.26	0.26	0.3	0.32	0.27	0.17	0.09	0.15	0.15
MnO	0.28	0.34	0.27	0.24	0.39	0.39	0.41	0.39	0.42	0.38	0.38	0.3	0.32	0.27	0.27
MgO	5.85	6.02	6.58	7.58	11.25	7.22	7.34	7.13	10.15	10.75	9.53	17.88	17.18	18.45	18.28
ZnO	0.08	0.08	0.04	0.11	0.19	0.01	0.12	0.19	0.09	0.15	0.07	0	0	0.06	0.01
NiO	0.3	0.19	0.26	0.19	0.2	0.25	0.27	0.19	0.15	0.25	0.31	0.04	0.09	0.06	0
Sum Ox%	100.52	100.38	99.33	100.44	99.22	99.57	99.25	100.36	100.63	99.6	98.62	99.65	99.76	99.5	99.35
Si	0.003	0.003	0.002	0.004	0.001	0.003	0.002	0.002	0.003	0.002	0.006	0.008	0.014	0.005	0.005
Ti	0.13	0.13	0.138	0.116	0.055	0.102	0.102	0.101	0.055	0.082	0.096	0.033	0.038	0.018	0.019
Al/Al IV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Al VI	0.067	0.067	0.084	0.187	0.315	0.064	0.063	0.065	0.282	0.234	0.135	1.256	1.222	1.22	1.241
Cr	0.876	0.904	0.924	1.018	1.201	1.205	1.197	1.21	1.297	1.315	1.214	0.564	0.582	0.621	0.6
Fe^{3+}	0.784	0.753	0.7	0.546	0.365	0.516	0.523	0.51	0.298	0.275	0.439	0.094	0.09	0.11	0.108
Fe^{2+}	0.802	0.796	0.773	0.713	0.474	0.704	0.693	0.708	0.534	0.522	0.586	0.281	0.314	0.235	0.247
V	0.008	0.008	0.012	0.009	0.006	0.005	0.007	0.007	0.008	0.009	0.008	0.004	0.002	0.003	0.003
Mn2+	0.008	0.01	0.008	0.007	0.011	0.012	0.012	0.012	0.012	0.011	0.011	0.007	0.008	0.007	0.007
Mg	0.311	0.32	0.351	0.391	0.562	0.382	0.389	0.374	0.505	0.541	0.495	0.752	0.728	0.778	0.77
Zn	0.002	0.002	0.001	0.003	0.005	0	0.003	0.005	0.002	0.004	0.002	0	0	0.001	0
Ni	0.008	0.006	0.007	0.005	0.005	0.007	0.008	0.005	0.004	0.007	0.009	0.001	0.002	0.001	0
Sum Cat#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
XCr	92.877	93.088	91.691	84.455	79.234	94.926	94.993	94.893	82.134	84.888	90.012	30.999	32.258	33.747	32.581
XFe^{2+}	72.073	71.357	68.78	64.586	45.741	64.867	64.033	65.405	51.403	49.1	54.2	27.231	30.162	23.215	24.26
YFe^{3+}	45.412	43.681	40.996	31.179	19.411	28.882	29.319	28.571	15.868	15.063	24.531	4.91	4.762	5.652	5.55
#Mg	0.28	0.29	0.31	0.35	0.54	0.35	0.36	0.35	0.49	0.51	0.46	0.73	0.70	0.77	0.76
#Cr	0.93	0.93	0.92	0.84	0.79	0.95	0.95	0.95	0.82	0.85	0.90	0.31	0.32	0.34	0.33

A6.2. Major-element composition of chromite found in mantle xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 4 oxygens

Label	32B_g_047	32B_g_048	34_a_001	34_c_016	34_j_032	34_j_033	34_j_034	34_j_035	34_j_036	37_a_006	37_a_007	37_a_079	37_a_080	37_a_082	37_a_083
Rock type	grt-Hz	grt-Hz	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr
Occurrence	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim
Analysed area	core	rim	rim	rim	core	rim	core	rim	core	core	rim	core	rim	core	rim
SiO_2	0.18	0.12	0.23	0.15	0.12	0.08	0.08	0.11	0.11	0.34	0.32	0.38	0.42	0.63	0.16
TiO_2	1.44	0.62	0.93	0.62	2.46	1.15	0.63	0.49	1.07	2	0.78	1.98	0.5	1.93	0.89
Al_2O_3	27.53	40.11	43.03	45.84	16.55	40.76	14.89	49.47	13.64	6.46	42.57	6.85	23.93	7.11	35.33
Cr_2O_3	37.14	25.6	19.45	17.06	43.83	22.49	47.99	14.23	49.71	56.57	21.57	56.91	16.3	55.86	28.9
$Fe_2O_{3(c)}$	4.06	3.62	6.15	6.83	5.88	4.87	7.19	5.64	5.74	5.9	5.24	4.17	14.78	6.04	7.27
FeO	12.78	10.72	11.35	9.01	18.36	14.13	16.41	10.92	16.99	16.11	10.21	17.13	0	15.72	9.67
V_2O_3	0.28	0.09	0.04	0.15	0.2	0.18	0.16	0.06	0.21	0.08	0.02	0.18	0.14	0.08	0.02
MnO	0.35	0.27	0.27	0.18	0.52	0.37	0.39	0.25	0.37	0.27	0.27	0.29	0.22	0.37	0.24
MgO	16.09	18.11	18.42	20.03	11.64	16.4	11.77	19.1	11.46	12.2	19.14	11.5	22.97	12.78	18.98
ZnO	0.05	0.14	0	0.04	0.06	0.12	0	0.06	0.07	0.08	0.07	0.12	0.11	0.08	0.01
NiO	0.07	0.06	0.09	0.04	0.15	0.04	0.04	0.02	0.13	0.21	0.08	0.13	0.08	0.2	0.08
Sum Ox%	99.95	99.47	99.96	99.95	99.78	100.6	99.57	100.36	99.49	100.22	100.28	99.64	79.45	100.8	101.55
Si	0.005	0.003	0.006	0.004	0.004	0.002	0.003	0.003	0.004	0.011	0.009	0.013	0.015	0.02	0.004
Ti	0.032	0.013	0.019	0.013	0.059	0.024	0.015	0.01	0.026	0.05	0.016	0.05	0.013	0.047	0.019
Al/Al IV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Al VI	0.96	1.322	1.397	1.46	0.622	1.343	0.565	1.559	0.521	0.252	1.375	0.269	0.984	0.273	1.162
Cr	0.869	0.566	0.424	0.365	1.106	0.497	1.221	0.301	1.274	1.478	0.467	1.498	0.45	1.441	0.638
Fe^{3+}	0.09	0.076	0.127	0.139	0.141	0.102	0.174	0.113	0.14	0.147	0.108	0.104	0.388	0.148	0.153
Fe^{2+}	0.316	0.251	0.261	0.204	0.49	0.331	0.442	0.244	0.461	0.445	0.234	0.477	0	0.429	0.226
V	0.007	0.002	0.001	0.003	0.005	0.004	0.004	0.001	0.005	0.002	0	0.005	0.004	0.002	0.001
Mn2+	0.009	0.006	0.006	0.004	0.014	0.009	0.011	0.006	0.01	0.008	0.006	0.008	0.006	0.01	0.006
Mg	0.71	0.755	0.756	0.807	0.554	0.684	0.565	0.761	0.554	0.601	0.781	0.57	1.195	0.621	0.79
Zn	0.001	0.003	0	0.001	0.002	0.002	0	0.001	0.002	0.002	0.001	0.003	0.003	0.002	0
Ni	0.002	0.001	0.002	0.001	0.004	0.001	0.001	0	0.003	0.006	0.002	0.003	0.002	0.005	0.002
Sum Cat#	3	3	3	3	3	3	3	3	3	3	3	3	3.059	3	3
XCr	47.506	29.982	23.27	19.977	63.985	27.014	68.37	16.17	70.977	85.448	25.369	84.785	31.373	84.053	35.435
XFe^{2+}	30.823	24.923	25.695	20.155	46.956	32.592	43.889	24.287	45.421	42.559	23.039	45.534	0	40.84	22.228
YFe^{3+}	4.709	3.877	6.541	7.074	7.555	5.272	8.883	5.752	7.233	7.816	5.54	5.584	21.302	7.962	7.823
#Mg	0.69	0.75	0.74	0.80	0.53	0.67	0.56	0.76	0.55	0.57	0.77	0.54	1.00	0.59	0.78
#Cr	0.48	0.30	0.23	0.20	0.64	0.27	0.68	0.16	0.71	0.85	0.25	0.85	0.31	0.84	0.35

A6.2. Major-element composition of chromite found in mantle xenoliths sampled by the Cat115 kimberlite. Oxides in wt%. Structural formula normalised to 4 oxygens

Label	37_a_084	37_a_085	40B_d_093	40B_d_094	40B_d_095
Rock type	grt-Wehr	grt-Wehr	grt-Hz	grt-Hz	grt-Hz
Occurrence	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim
Analysed area	core	rim	core	core	rim
SiO_2	1.15	0.31	0.46	0.34	0.85
TiO_2	1.58	0.55	2.48	0.86	0.48
Al_2O_3	27.48	40.42	24.2	42.99	48.49
Cr_2O_3	34.64	24.19	34.79	19.58	14.24
$Fe_2O_{3(c)}$	4.61	5.39	6.52	6.04	5.36
FeO	10.29	10.13	16.64	11.34	10.04
V_2O_3	0.09	0.09	0.3	0.08	0.06
MnO	0.22	0.27	0.32	0.27	0.32
MgO	18.36	18.9	14.1	18.5	20.13
ZnO	0.02	0.01	0.01	0	0
NiO	0.2	0	0.04	0.1	0
Sum Ox%	98.62	100.26	99.87	100.1	99.99
Si	0.034	0.008	0.014	0.009	0.023
Ti	0.035	0.011	0.057	0.018	0.01
Al/Al IV	0	0	0	0	0
Al VI	0.953	1.317	0.867	1.393	1.526
Cr	0.806	0.529	0.836	0.426	0.301
Fe^{3+}	0.102	0.112	0.149	0.125	0.108
Fe^{2+}	0.253	0.234	0.423	0.261	0.224
V	0.002	0.002	0.007	0.002	0.001
Mn2+	0.006	0.006	0.008	0.006	0.007
Mg	0.805	0.779	0.638	0.758	0.801
Zn	0	0	0	0	0
Ni	0.005	0	0.001	0.002	0
Sum Cat#	3	3	3	3	3
XCr	45.82	28.642	49.088	23.403	16.459
XFe^{2+}	23.918	23.112	39.841	25.601	21.867
YFe^{3+}	5.481	5.731	8.048	6.433	5.571
#Mg	0.76	0.77	0.60	0.74	0.78
#Cr	0.46	0.29	0.49	0.23	0.16

A6.2. Major-element composition of metasomatic phlogopite in peridotite and eclogite xenoliths and in clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%

Label	30A_b_062	30A_b_063	30A_f_067	30A_f_068	30A_g_072	30A_g_073	30A_h_080	30A_h_081	30A_h_082	30A_i_083	30A_m_091	30A_j_086	30A_j_088	30A_j_089
Rock	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz
Rock texture	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Area	core	core	core	core	core	core	core	core	core	core	core	rim	rim	rim
SiO_2	42.47	42.07	42.25	42.31	42.14	42.21	41.3	42.23	41.7	42.47	42.24	39.28	39.94	37.05
TiO_2	0.7	0.67	0.65	0.7	0.64	0.67	1.19	0.69	0.7	0.66	0.69	3.12	2.55	2.84
Al_2O_3	12.23	12.09	12.4	12.48	12.16	11.99	12.77	12.1	11.97	12.23	12.14	15.33	14.25	13.81
Cr_2O_3	0.31	0.31	0.35	0.34	0.37	0.33	0.47	0.28	0.27	0.34	0.34	1.71	1.34	1.59
FeO	2.98	2.9	2.83	2.73	2.86	2.9	3.61	3.01	2.83	2.84	2.93	3.82	3.62	3.86
MnO	0	0	0.04	0.04	0	0.03	0.03	0.04	0	0.01	0	0.06	0.02	0.07
MgO	25.73	25.71	25.51	26.04	25.59	25.78	24.62	25.74	25.53	25.18	26.1	21.74	22.77	20.9
CaO	0.01	0.01	0.01	0	0	0.02	0.08	0	0	0	0.01	0	0	0
Na_2O	0.18	0.18	0.13	0.15	0.14	0.15	0.24	0.24	0.13	0.08	0.18	0.3	0.27	0.21
K_2O	9.97	9.93	9.83	9.99	9.95	10.05	9.87	10.12	9.92	9.82	9.87	9.57	9.78	9.76
BaO	0.14	0.02	0.28	0.36	0.34	0.16	0.1	0.26	0.02	0.2	0.14	0.14	0	0.2
NiO	0.26	0.21	0.19	0.26	0.23	0.21	0.26	0.22	0.21	0.26	0.2	0.23	0.31	0.23
F	0	0.46	0.38	0.07	0.05	0.07	0.53	0.26	0.53	0.29	0	0.42	0.32	0.37
Cl	0.17	0.17	0.25	0.18	0.22	0.22	0.07	0.15	0.21	0.19	0.17	0.03	0.06	0.06
H_2O(c)	4.2	3.95	3.98	4.18	4.13	4.13	3.93	4.06	3.87	4.03	4.19	4.01	4.04	3.78
O=F	0	0.19	0.16	0.03	0.02	0.03	0.22	0.11	0.22	0.12	0	0.18	0.13	0.16
O=Cl	0.04	0.04	0.06	0.04	0.05	0.05	0.02	0.03	0.05	0.04	0.04	0.01	0.01	0.01
Sum Ox%	99.3	98.44	98.84	99.76	98.75	98.83	98.83	99.25	97.61	98.43	99.16	99.59	99.11	94.55
Si	6.004	5.997	6.001	5.962	6	6.003	5.895	5.991	5.997	6.048	5.979	5.587	5.697	5.59
Ti	0.074	0.072	0.069	0.074	0.068	0.071	0.128	0.073	0.076	0.071	0.074	0.334	0.274	0.322
Al/Al IV	1.996	2.003	1.999	2.038	2	1.997	2.105	2.009	2.003	1.952	2.021	2.413	2.303	2.41
Al VI	0.042	0.029	0.077	0.034	0.041	0.013	0.044	0.013	0.026	0.1	0.004	0.157	0.093	0.047
Cr	0.035	0.034	0.039	0.038	0.042	0.037	0.053	0.031	0.03	0.038	0.038	0.193	0.151	0.189
Fe^{2+}	0.353	0.346	0.336	0.322	0.34	0.345	0.43	0.357	0.34	0.338	0.347	0.454	0.432	0.487
Mn^{2+}	0	0	0.005	0.005	0	0.003	0.004	0.005	0.001	0.001	0	0.008	0.002	0.009
Mg	5.421	5.464	5.4	5.469	5.431	5.465	5.237	5.441	5.471	5.344	5.506	4.608	4.841	4.701
Ca	0.002	0.002	0.001	0	0	0.004	0.013	0	0	0	0.001	0	0	0
Na	0.049	0.048	0.036	0.041	0.038	0.042	0.067	0.067	0.037	0.021	0.049	0.084	0.076	0.062
K	1.798	1.806	1.78	1.796	1.807	1.824	1.796	1.83	1.819	1.784	1.782	1.736	1.779	1.879
Ba	0.008	0.001	0.015	0.02	0.019	0.009	0.006	0.014	0.001	0.011	0.008	0.008	0	0.012
Ni	0.03	0.024	0.022	0.029	0.026	0.023	0.029	0.025	0.024	0.029	0.023	0.026	0.035	0.028
F	0	0.206	0.173	0.032	0.022	0.033	0.239	0.119	0.241	0.13	0	0.188	0.144	0.176
Cl	0.041	0.04	0.06	0.043	0.052	0.054	0.018	0.036	0.051	0.046	0.041	0.008	0.015	0.015
OH	3.959	3.753	3.767	3.925	3.926	3.913	3.743	3.846	3.708	3.824	3.959	3.804	3.841	3.809
Sum Cat#	19.81	19.826	19.781	19.828	19.813	19.835	19.808	19.858	19.826	19.739	19.832	19.608	19.683	19.735
XMg	0.939	0.94	0.941	0.944	0.941	0.941	0.924	0.938	0.941	0.941	0.941	0.91	0.918	0.906
Oct	5.953	5.968	5.947	5.971	5.949	5.957	5.926	5.946	5.968	5.922	5.991	5.78	5.828	5.783
Int	1.856	1.858	1.833	1.857	1.864	1.878	1.881	1.912	1.857	1.817	1.84	1.827	1.855	1.952

A6.2. Major-element composition of metasomatic phlogopite in peridotite and eclogite xenoliths and in clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%

Label	30A_j_090	30A_b_064	30A_b_065	30A_b_066	30A_f_069	30A_g_079	30A_f_071	30A_g_074	30A_g_075	30A_g_077	30A_i_085	30A_j_087	30A_m_092	30A_g_078
Rock	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz
Rock texture	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Area	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	fine rim	fine rim
SiO_2	40.41	39.23	39.26	39.85	39.37	38.84	38.98	38.96	38.33	38.59	38.34	38.53	43.3	40.27
TiO_2	2.53	3.28	3.48	3.41	3.38	3.39	3.54	3.18	3.07	3.16	3.48	2.81	4.24	4.29
Al_2O_3	14.22	14.84	14.6	14.9	14.92	13.71	14.63	14.74	14.37	13.93	13.72	14.67	9.69	7.88
Cr_2O_3	1.42	1.34	1.24	0.81	1.07	1.95	1.24	2	1.91	2.08	2.06	1.59	0.09	0.11
FeO	3.55	3.62	3.57	3.76	4.22	4.04	4.54	3.76	3.89	4.14	4.12	4.06	5.96	6.34
MnO	0.02	0.02	0.03	0.06	0.04	0.06	0.02	0.02	0.08	0.03	0.05	0.01	0.04	0.08
MgO	22.73	22.55	22.01	22.9	22.28	21.18	21.73	22.27	21.04	22.16	21.67	22.82	24.63	22.75
CaO	0	0	0.02	0	0	0.01	0	0	0.07	0.02	0	0.5	0	0.07
Na_2O	0.23	0.27	0.33	0.39	0.25	0.23	0.2	0.29	0.24	0.21	0.32	0.42	0.54	0.38
K_2O	9.38	9.53	9.55	9.57	9.68	9.5	9.66	9.47	9.54	9.33	9.6	8.8	9.46	8.41
BaO	0	0.22	0.39	0.04	0	0.27	0.08	0	0.16	0.22	0.27	0.39	0.43	0.6
NiO	0.27	0.2	0.23	0.26	0.21	0.19	0.17	0.15	0.17	0.22	0.15	0.18	0.14	0.12
F	0.32	0.34	0.2	0.02	0.29	0	0	0.1	0.44	0.34	0.52	0.29	3.15	2.44
Cl	0.06	0.06	0.03	0.05	0.03	0.03	0.03	0.06	0.04	0.07	0.04	0.03	0.05	0.01
H_2O(c)	4.05	4.03	4.09	4.23	4.07	4.11	4.17	4.13	3.87	3.96	3.86	4.03	2.82	2.83
O=F	0.13	0.15	0.08	0.01	0.12	0	0	0.04	0.19	0.15	0.22	0.12	1.33	1.03
O=Cl	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0
Sum Ox%	99.05	99.37	98.93	100.22	99.7	97.5	98.98	99.07	97.03	98.28	97.99	99.01	103.21	95.55
Si	5.745	5.588	5.622	5.614	5.594	5.664	5.593	5.568	5.613	5.587	5.584	5.527	5.999	6.049
Ti	0.271	0.351	0.375	0.361	0.361	0.372	0.382	0.342	0.339	0.344	0.381	0.303	0.442	0.484
Al/Al IV	2.255	2.412	2.378	2.386	2.406	2.336	2.407	2.432	2.387	2.376	2.355	2.473	1.582	1.395
Al VI	0.127	0.08	0.086	0.088	0.092	0.021	0.067	0.051	0.094	0	0	0.007	0	0
Cr	0.16	0.15	0.141	0.09	0.12	0.225	0.141	0.226	0.221	0.239	0.237	0.181	0.01	0.013
Fe^{2+}	0.422	0.431	0.428	0.443	0.502	0.493	0.544	0.449	0.476	0.501	0.501	0.487	0.691	0.797
Mn^{2+}	0.002	0.003	0.003	0.008	0.005	0.007	0.003	0.003	0.01	0.004	0.007	0.001	0.005	0.01
Mg	4.818	4.787	4.699	4.809	4.719	4.602	4.646	4.744	4.593	4.782	4.703	4.878	5.086	5.093
Ca	0	0	0.003	0	0	0.001	0	0	0.01	0.002	0	0.076	0	0.012
Na	0.063	0.073	0.09	0.107	0.069	0.065	0.054	0.08	0.069	0.058	0.091	0.116	0.146	0.11
K	1.702	1.732	1.745	1.719	1.754	1.766	1.767	1.726	1.782	1.723	1.783	1.61	1.672	1.61
Ba	0	0.012	0.022	0.002	0	0.016	0.004	0	0.009	0.012	0.016	0.022	0.023	0.036
Ni	0.031	0.023	0.026	0.029	0.024	0.022	0.02	0.018	0.02	0.026	0.018	0.021	0.016	0.014
F	0.144	0.155	0.089	0.011	0.133	0	0	0.045	0.206	0.158	0.238	0.133	1.38	1.158
Cl	0.015	0.015	0.008	0.011	0.008	0.007	0.007	0.013	0.01	0.016	0.009	0.007	0.011	0.004
OH	3.842	3.83	3.903	3.978	3.86	3.993	3.993	3.942	3.784	3.826	3.753	3.86	2.609	2.839
Sum Cat#	19.596	19.643	19.619	19.657	19.647	19.589	19.629	19.638	19.623	19.653	19.676	19.702	19.672	19.623
XMg	0.919	0.917	0.917	0.916	0.904	0.903	0.895	0.914	0.906	0.905	0.904	0.909	0.88	0.865
Oct	5.831	5.825	5.758	5.827	5.824	5.741	5.803	5.833	5.753	5.894	5.847	5.878	6.249	6.411
Int	1.765	1.818	1.861	1.829	1.823	1.848	1.826	1.806	1.871	1.796	1.89	1.824	1.842	1.768

A6.2. Major-element composition of metasomatic phlogopite in peridotite and eclogite xenoliths and in clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%

Label	37_b_096	37_b_097	37_c_101	37_f_105	37_f_106	37_a_093	37_a_094	37_a_095	37_c_098	37_c_099	37_c_100	37_f_102	37_f_103	37_f_104
Rock	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr
Rock texture	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Area	core	core	core	core	core	rim	rim	rim	rim	rim	rim	rim	rim	rim
SiO_2	41.15	41.96	41.54	42.32	42.71	37.9	39	37.91	39.31	39.92	39.14	39.71	39.81	38.85
TiO_2	0.59	0.6	0.6	0.61	0.6	4.06	3.49	4.01	2.87	2.7	2.63	3.05	3.1	3.05
Al_2O_3	12.01	12.59	11.98	12.14	12.32	15.04	14.48	14.81	14.98	14.41	14.06	14.02	14.24	13.78
Cr_2O_3	0.93	0.92	0.97	0.88	0.81	1.6	2.11	1.66	3.5	3.24	3.22	2.89	2.86	2.69
FeO	2.94	2.84	2.78	2.82	2.89	4.18	3.92	4	3.69	3.67	3.4	3.28	3.55	3.7
MnO	0	0.01	0	0.02	0.07	0	0	0	0.07	0	0	0	0.03	0.01
MgO	25.63	25.4	25.14	25.05	26.03	21.4	22.42	21.17	21.69	22.23	21.59	22.2	22.33	22.67
CaO	0.06	0.05	0.01	0.04	0.01	0	0.02	0	0.02	0.02	0.05	0.01	0.02	0.02
Na_2O	0.11	0.11	0.09	0.11	0.13	0.44	0.38	0.4	0.3	0.2	0.13	0.15	0.16	0.23
K_2O	9.91	10.12	9.93	9.78	9.73	9.54	8.86	9	9.72	9.5	9.49	9.7	9.39	9.09
BaO	0	0.08	0	0	0.2	0.14	0.04	0.22	0.12	0	0.18	0.02	0.14	0
NiO	0.18	0.21	0.19	0.23	0.16	0.03	0.09	0.08	0.11	0.21	0.19	0.26	0.22	0.12
F	0.72	0.22	0.22	0	0.12	0.69	0.35	0.35	0.84	0.22	0	0.1	0.2	0.77
Cl	0.09	0.09	0.09	0.11	0.08	0.02	0.04	0.05	0.04	0.04	0.05	0.05	0.05	0.08
$H_2O(c)$	3.8	4.1	4.04	4.18	4.2	3.82	4.03	3.94	3.83	4.13	4.14	4.15	4.13	3.78
O=F	0.3	0.09	0.09	0	0.05	0.29	0.15	0.15	0.36	0.09	0	0.04	0.08	0.32
O=Cl	0.02	0.02	0.02	0.02	0.02	0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
Sum Ox%	97.78	99.19	97.46	98.25	100	98.58	99.08	97.44	100.74	100.41	98.25	99.54	100.13	98.5
Si	5.925	5.947	5.985	6.033	5.989	5.471	5.565	5.517	5.554	5.634	5.651	5.651	5.631	5.591
Ti	0.063	0.064	0.065	0.065	0.063	0.441	0.375	0.439	0.305	0.287	0.286	0.327	0.33	0.33
Al/Al IV	2.038	2.053	2.015	1.967	2.011	2.529	2.435	2.483	2.446	2.366	2.349	2.349	2.369	2.337
Al VI	0	0.05	0.02	0.072	0.025	0.03	0	0.057	0.048	0.03	0.042	0.002	0.005	0
Cr	0.106	0.103	0.11	0.099	0.09	0.183	0.238	0.191	0.391	0.362	0.368	0.325	0.319	0.306
Fe^{2+}	0.354	0.336	0.335	0.336	0.339	0.505	0.468	0.487	0.436	0.433	0.41	0.39	0.42	0.445
Mn^{2+}	0	0.001	0.001	0.002	0.009	0	0	0	0.009	0	0	0	0.003	0.001
Mg	5.5	5.366	5.4	5.323	5.44	4.605	4.767	4.591	4.569	4.677	4.646	4.709	4.708	4.862
Ca	0.009	0.008	0.001	0.005	0.002	0	0.003	0	0.003	0.003	0.008	0.001	0.004	0.004
Na	0.031	0.029	0.025	0.03	0.035	0.124	0.106	0.113	0.084	0.056	0.037	0.04	0.045	0.065
K	1.819	1.83	1.825	1.778	1.741	1.757	1.613	1.67	1.751	1.711	1.747	1.76	1.695	1.669
Ba	0	0.004	0	0	0.011	0.008	0.002	0.012	0.006	0	0.01	0.001	0.008	0
Ni	0.021	0.024	0.022	0.027	0.019	0.004	0.011	0.01	0.013	0.024	0.022	0.03	0.025	0.014
F	0.329	0.098	0.1	0	0.054	0.314	0.156	0.159	0.378	0.1	0	0.045	0.089	0.349
Cl	0.021	0.022	0.021	0.027	0.019	0.004	0.009	0.013	0.01	0.01	0.012	0.012	0.012	0.019
OH	3.649	3.88	3.879	3.973	3.927	3.682	3.835	3.828	3.613	3.889	3.988	3.943	3.898	3.632
Sum Cat#	19.865	19.816	19.802	19.737	19.773	19.657	19.583	19.571	19.616	19.583	19.575	19.585	19.562	19.625
XMg	0.94	0.941	0.942	0.941	0.941	0.901	0.911	0.904	0.913	0.915	0.919	0.924	0.918	0.916
Oct	6.043	5.944	5.952	5.924	5.984	5.768	5.859	5.774	5.771	5.813	5.774	5.782	5.811	5.958
Int	1.859	1.872	1.851	1.814	1.789	1.888	1.724	1.796	1.844	1.77	1.802	1.802	1.751	1.738

A6.2. Major-element composition of metasomatic phlogopite in peridotite and eclogite xenoliths and in clinopyroxene megacrysts sampled by the Angolan kimberlites. Oxides in wt%

Label	CAT-34_a_030	CAT-34_a_033	CAT-34_j_049	CAT-46_a_083	CAT-94_a_102	CAT-94_f_118	CAT-94_f_119
Rock	ecl	ecl	ecl	ecl	cpx meg.	cpx meg.	cpx meg.
Rock texture	coarse	coarse	coarse	coarse	inclusion	inclusion	inclusion
Area	core	core	core	core	core	core	core
SiO_2	38.08	38	38.17	39.67	40.93	40.6	40.33
TiO_2	2.31	2.02	2.15	1.47	1.82	2.05	1.97
Al_2O_3	17.42	17.34	17.25	12.58	10.92	12.17	12.73
Cr_2O_3	0.14	0.09	0.07	0.85	0.26	0.21	0.27
FeO	9.8	9.53	9.54	5.08	6.77	6.45	6.64
MnO	0.07	0.02	0.02	0.13	0.04	0.07	0.05
MgO	17.16	17.81	17.87	23.62	20.04	22.6	21.05
CaO	0.02	0.04	0	0.15	0.02	0.02	0.01
Na_2O	0.9	0.54	0.69	0.29	0.7	0.77	1.26
K_2O	9.54	9.59	9.5	7.74	8.93	9.67	8.42
BaO	-	-	-	-	-	-	-
NiO	0	0.03	0.03	0.19	0.13	0.14	0.18
F	0.6	0.6	0.29	0	0.49	0.37	0.3
Cl	-	-	-	-	-	-	-
H_2O(c)	3.84	3.83	3.99	4.09	3.75	3.97	3.95
O=F	0.25	0.25	0.12	0	0.21	0.16	0.13
O=Cl	-	-	-	-	-	-	-
Sum Ox%	99.63	99.2	99.46	95.85	94.59	98.94	97.03
Si	5.533	5.535	5.541	5.823	6.156	5.866	5.908
Ti	0.252	0.221	0.235	0.162	0.205	0.223	0.217
Al/Al IV	2.467	2.465	2.459	2.176	1.844	2.074	2.092
Al VI	0.517	0.512	0.493	0	0.092	0	0.107
Cr	0.016	0.011	0.008	0.098	0.031	0.024	0.031
Fe^{2+}	1.19	1.161	1.159	0.624	0.851	0.78	0.814
Mn^{2+}	0.008	0.002	0.002	0.016	0.005	0.009	0.006
Mg	3.716	3.867	3.867	5.168	4.493	4.868	4.596
Ca	0.004	0.007	0	0.023	0.003	0.003	0.002
Na	0.255	0.152	0.195	0.083	0.204	0.216	0.357
K	1.768	1.781	1.758	1.449	1.714	1.782	1.574
Ba	-	-	-	-	-	-	-
Ni	0	0.004	0.003	0.022	0.015	0.016	0.021
F	0.274	0.276	0.132	0	0.234	0.171	0.139
Cl	-	-	-	-	-	-	-
OH	3.726	3.724	3.868	4	3.766	3.829	3.861
Sum Cat#	19.726	19.717	19.721	19.644	19.614	19.86	19.725
XMg	0.757	0.769	0.769	0.892	0.841	0.862	0.85
Oct	5.7	5.777	5.767	6.09	5.693	5.919	5.792
Int	2.026	1.94	1.954	1.555	1.921	2.001	1.933

A6.3. Trace-element composition of olivine in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	11_c_108	11_c_108	11_c_109	11_c_109	11_c_109	34_i_035	34_i_035	34_i_035	34_i_035	30A_c_112	30A_c_112	30A_l_129	30A_l_129
Rock type	spl-Hz	spl-Hz	spl-Hz	spl-Hz	spl-Hz	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz
Rock microstr.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Sc	3.27	3.13	3.26	3.25	8.9	32.2	34.8	36.1	33.5	3.71	3.72	2.94	2.93
Ti	<bd	<bd	<bd	<bd	20.8	2.33	2.55	2.62	2.82	157	146	159	163
V	<bd	<bd	<bd	<bd	39.3	58.6	61.8	62.8	65.3	4.45	4.73	4.9	4.6
Cr	4.5	6.9	3.95	4.59	1270	124	126	133	135	74.8	87	90.7	89.2
Co	133	127	136	133	28.4	2900	2880	2980	3070	150	138	138	141
Ni	2690	2540	2560	2580	275	<bd	<bd	<bd	<bd	3180	3000	2760	2760

Label	30A_l_129	30A_b_106	30A_b_106	40B_1	40B_2	40B_3	40B_4	31_g_094	31_g_094	31_g_095	31_g_095	31_m_113	37_d_116
Rock type	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Wehr
Rock microstr.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Sc	3.14	0.231	4.1	3.45	3.46	3.75	3.79	3.43	3.41	3.37	3.37	3.1	3.29
Ti	159	8.93	161	92.3	94.6	91.3	94.9	27.5	29.9	28.6	28.1	32.7	81.7
V	4.9	0.259	4.71	6.62	7.14	7.27	7.2	2.3	2.34	2.39	2.21	1.95	3.22
Cr	91.6	4.33	74.5	190	194	207	203	61.7	61.9	61.2	58	57.2	127
Co	138	8.25	149	163	166	172	169	155	153	148	148	146	144
Ni	2710	175	3160	3340	3480	3500	3470	3140	3130	3090	3010	2930	3110

Label	37_d_116	37_d_117	37_d_117	10_h_124	10_h_124	10_h_124	10_h_124	10_b_097	10_f_115	10_f_115	28_c_42	28_c_42	28_c_42
Rock type	grt-Wehr	grt-Wehr	grt-Wehr	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Hz	grt-Hz	grt-Hz
Rock microstr.	coarse	coarse	coarse	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared
Sc	3.12	3.16	3.17	4.19	4.17	4.11	4.36	4.01	3.29	4.12	3.99	4.03	4.07
Ti	78.7	76.8	74.5	188	184	182	188	173	143	173	153.1	153.6	159.4
V	3.19	3	3.37	12.1	12.2	12.5	12.4	11.1	9.29	13.4	11.7	11.93	12.05
Cr	124	116	130	314	315	320	316	294	246	348	650	644	610
Co	146	134	144	184	177	176	185	169	137	184	177.9	183.2	180.1
Ni	3150	2990	3290	3680	3580	3540	3740	3320	2680	3730	15740	7480	4940

A6.3. Trace-element composition of olivine in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	28_c_42	28_l_106	28_l_106	28_l_106	28_j_064	28_j_065	28_j_066	24A_01	24A_02	24A_03	24A_04	24A_05	24A_06
Rock type	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz
Rock microstr.	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared
Sc	4.01	4.07	3.42	4.44	4.08	3.89	3.57	3.59	3.37	3.39	3.6	5.28	5.64
Ti	151.4	126.1	118.8	155.1	150.9	<bd	133.3	35.1	32.9	34.7	54.4	45.6	48.1
V	11.4	9.23	9.16	11.74	11.68	12.5	9.92	8.47	8.88	8.79	9.06	8.99	9.78
Cr	567	436	435	585	534	451	453	334	349	339	398	375	407
Co	180.5	152.8	148.2	195	183.9	152.2	151.6	131.6	135	131.4	141	143.2	140.3
Ni	3910	2500	2386	3030	3220	2530	2449	2790	2842	2833	3210	3210	3100

Label	24A_07	24A_08	24A_09	12_j_100	12_j_100	12_j_100	12_j_100	12_f_092	12_f_092	12_f_092	12_f_092	12_f_092	32B_h_065
Rock type	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz
Rock microstr.	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared
Sc	4.82	5.61	5.67	8.03	7.22	7.16	6.1	7.25	7.41	7.17	6.81	6.51	3.97
Ti	44	43.7	46.1	237	197.6	197	156.9	120.7	188	144.3	125.8	123.2	119.8
V	8.87	8.94	10.59	13.69	11.92	12.23	9.95	9.49	12	9.01	9.24	9.44	11.62
Cr	370	367	380	818	624	689	497	478	457	463	431	438	442
Co	141.9	139.4	145.3	209	193.2	173.4	154.1	151.4	151.8	149.2	156.6	153.4	146
Ni	3180	2990	3230	4020	3720	3460	3211	3270	2980	3030	3270	3230	3670

Label	32B_h_065	32B_d_048	32B_d_048	32B_d_048	32B_d_048	32B_g_051	32B_g_051
Rock type	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz
Rock microstr.	sheared	sheared	sheared	sheared	sheared	sheared	sheared
Sc	3.67	4.08	4.13	4.37	4.11	5.02	4.58
Ti	122.1	114.1	133	125.2	109.4	180	129
V	11.91	11.33	12.33	11.56	12.08	18.5	12.1
Cr	451	336	366	410	411	1140	571
Co	149.3	150.3	151.4	163.2	150.2	148.6	155
Ni	3660	2550	2810	3040	2780	3680	3820

Abbreviations: garnet (gt), spinel (sp), harzburgite (Hz), lherzolite (Lhz), wehrlite (Wehr)

A6.3. Trace-element composition of orthopyroxene in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	10_202	10_203	10_204	11_281	11_282	11_283	11_284	28_220	28_221	28_222	30A_261	30A_262	30A_263
rock type	grt-Hz	grt-Hz	grt-Hz	spl-Hz	spl-Hz	spl-Hz	spl-Hz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz
rock texture	sheared	sheared	sheared	coarse	coarse	coarse	coarse	sheared	sheared	sheared	coarse	coarse	coarse
Ca	5540	5870	5930	5440	5770	2330	1520	10200	8780	7430	1480	1460	1550
Sc	6.1	6.4	6.3	10.6	12.6	14.3	10.9	6.5	6.5	6.4	5.0	5.0	5.1
Ti	905	925	953	26.6	30.2	32.3	28.3	893	883	907	341	319	361
V	59.2	58.8	60.2	43.8	50.4	63.3	48.6	55.8	56.7	57.4	27	25.7	29
Cr	2190	2150	2140	1970	1830	2620	1690	4650	4850	5100	838	853	851
Co	71.2	70.7	72.2	33	37.9	41.9	39.1	64.7	66.9	71.3	50.6	49.1	51
Ni	1040	1030	1040	328	366	419	382	bdl	bdl	bdl	725	683	754
Ga	3.5	3.4	3.3	0.6	0.8	0.8	0.7	3.2	3.2	3.4	2.1	1.8	2.0
Rb	bdl	bdl	0.466	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Sr	0.56	0.61	6.16	bdl	7.00	bdl	bdl	bdl	bdl	bdl	bdl	0.12	1.63
Y	0.12	0.11	0.14	bdl	bdl	bdl	bdl	0.34	0.27	0.21	bdl	bdl	0.07
Zr	0.37	0.30	0.66	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.25	0.20	0.35
Nb	bdl	0.06	0.29	bdl	bdl	bdl	bdl	0.08	0.08	0.06	0.08	bdl	0.24

Label	31_129	31_130	31_131	32B_148	32B_149	32B_150
rock type	grt-Lhz	grt-Lhz	grt-Lhz	grt-Hz	grt-Hz	grt-Hz
rock texture	coarse	coarse	coarse	sheared	sheared	sheared
Ca	1110	1250	1490	5460	5290	5260
Sc	4.7	4.6	4.6	5.9	5.9	6.0
Ti	102	127	105	665	638	633
V	25.1	29.3	24.9	55.8	56.2	55.9
Cr	1400	1690	1360	2840	2760	2740
Co	54.2	52.3	53.5	59.7	57.2	60.5
Ni	636	644	649	882	927	972
Ga	2.3	2.5	2.3	1.9	1.8	1.9
Rb	bdl	bdl	bdl	bdl	bdl	bdl
Sr	0.05	0.08	0.08	0.61	0.71	0.57
Y	bdl	bdl	bdl	0.08	0.07	0.08
Zr	bdl	bdl	bdl	0.28	0.27	0.27
Nb	bdl	bdl	0.06	bdl	bdl	bdl

A6.3. Trace-element composition of clinopyroxene in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	12-c-132	12-g-125	12-g-126	12-g-127	31_m_114	31_m_115	31_m_116	34_h_032	34_h_033	34_h_034	37_a_010	37_a_010	37_a_010	37_a_012	37_a_012
Rock type	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr
Rock microstr.	sheared	sheared	sheared	sheared	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Occurrence	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim
Analysed area	core	core	core	core	core	core	core	core	core	core	rim	rim	rim	core	core
Sc	22.41	25.51	27.56	28.9	20.53	21.14	21.18	34	36.56	34.54	36.9	40	34.38	36.35	38.34
Ti	1344	1554	1681	1726	286.9	283	280.9	383	416	410	1233	1221	1307	1256	1208
V	255.7	320.5	365.5	374	327.9	341	334	590	637	602	257.1	276.5	313	264.3	250.1
Cr	9720	8340	7180	7430	11370	11760	11360	19270	22390	18910	26920	33800	32000	29400	25060
Mn	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Co	29.56	33.78	36.7	39.1	16.92	16.56	16.24	14.92	14.5	15.67	16.52	19.51	17.63	15.72	15.27
Ni	509	613	650	677	295	287	281	282	281	286	180.7	182.9	211	282	269.6
Ga	4.27	4.35	4.1	4.58	6.57	6.43	6.29	6.87	7.07	7.1	4.08	4.26	4.9	4.2	3.94
Rb	bdl	bdl	0.105	bdl	bdl	bdl	bdl	0.056	bdl	0.221	0.143	0.03	0.177	0.32	0.3
Sr	112.9	126.6	137.3	137.8	225.7	221	202.2	451	471	487	198	194.3	217	193.7	173.9
Y	2.49	2.63	2.86	3.02	1.518	1.442	1.368	1.38	1.426	1.427	6.26	7.07	6.54	6.96	5.44
Zr	7.94	8.73	9.23	9.16	9.55	9.87	8.27	23.9	27.8	26.2	99.8	116.3	108.2	109.1	91.7
Nb	0.158	0.159	0.27	0.172	0.149	0.17	0.152	0.177	0.158	0.196	0.81	0.384	0.607	0.365	0.314
Ba	0.261	0.28	1.6	0.512	0.483	0.597	0.48	1.19	0.476	0.91	1.14	0.255	1.82	1.08	1.04
La	1.677	2.027	2.27	2.27	9.05	9.31	8.06	28	27.6	27.5	3.41	3.06	3.95	3.13	2.4
Ce	6.79	8.08	9.01	9.39	29	30	25.8	76.4	76.3	76.8	14.4	14.2	16.4	13.29	9.83
Pr	1.186	1.403	1.55	1.665	3.49	3.64	3.21	8.37	8.26	8.1	2.4	2.38	2.71	2.37	1.76
Nd	6.46	7.33	7.83	8.15	12.56	13.14	11.89	28.5	27.9	27.7	12.49	12.31	14.04	12.71	9.68
Sm	1.67	1.8	1.94	1.94	1.622	1.701	1.486	3.21	3.61	3.29	3.22	3.53	3.64	3.42	2.64
Eu	0.453	0.538	0.567	0.543	0.405	0.433	0.374	0.798	0.838	0.88	1.087	1.137	1.19	1.113	0.847
Gd	1.45	1.52	1.59	1.49	1.032	1.107	0.995	2.07	1.97	1.97	2.94	3.24	3.5	3.25	2.53
Tb	0.151	0.157	0.168	0.191	0.1071	0.1078	0.1046	0.143	0.167	0.154	0.35	0.392	0.387	0.391	0.294
Dy	0.684	0.764	0.791	0.764	0.432	0.467	0.42	0.514	0.472	0.556	1.71	1.9	1.93	1.96	1.53
Ho	0.105	0.0906	0.097	0.1047	0.0584	0.0611	0.0576	0.0549	0.0587	0.0532	0.248	0.292	0.271	0.293	0.213
Er	0.21	0.184	0.205	0.233	0.107	0.115	0.098	0.105	0.097	0.126	0.552	0.582	0.534	0.604	0.47
Tm	0.0195	0.017	0.0171	0.016	0.0098	0.0097	0.0065	0.008	0.0072	0.0074	0.0458	0.0587	0.0549	0.0631	0.0419
Yb	0.108	0.096	0.093	0.102	0.0413	0.049	0.0451	0.0318	0.035	0.044	0.271	0.25	0.263	0.28	0.217
Lu	0.007	0.0079	0.0089	0.0105	0.0043	0.0045	0.0038	0.00086	0.0032	0.0029	0.0301	0.0286	0.0263	0.0315	0.0254
Hf	0.495	0.501	0.516	0.516	0.273	0.301	0.307	0.591	0.646	0.595	5.29	5.57	4.64	5.99	5.29
Ta	0.0082	0.0084	0.0133	0.0078	0.0133	0.016	0.0114	0.0214	0.0176	0.0159	0.0573	0.0475	0.0575	0.0423	0.0327
Th	0.0138	0.0103	0.0222	0.0176	0.392	0.385	0.359	1.021	1.086	1.072	0.103	0.0492	0.0534	0.076	0.063
U	0.00054	0.0035	0.0044	0.0043	0.0926	0.104	0.1034	0.216	0.231	0.219	0.0177	0.0078	0.0148	0.031	0.0244

A6.3. Trace-element composition of clinopyroxene in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	37_a_012	37_a_078	37_a_078	37_a_078	37_f_019	10_a_089	10_g_019	10_g_020	10_i_134	10_j_135	10_j_141	10_j_142	28_e_51	28_e_52	28_f_53
Rock type	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Hz	grt-Hz	grt-Hz
Rock microstr.	coarse	coarse	coarse	coarse	coarse	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared
Occurrence	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral
Analysed area	core	anhedral	anhedral	anhedral	rim	core	core	core	core	core	core	core	core	core	core
Sc	40	37.55	38.63	36.89	44.2	22.76	22.94	22.07	22.07	22.77	23.32	22.69	21.51	19.56	22.61
Ti	1225	1279	1299	1204	1310	1791	1796	1758	1803	1871	1843	1830	1628	1589	1688
V	251.1	291.6	306.5	268.9	281.7	314.2	283.1	307.5	345.8	346.8	357	356	353.6	312.8	335.2
Cr	23780	16290	17370	17920	15780	10080	8970	9830	10740	10760	11510	10980	8050	9770	11310
Mn	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Co	15.64	19.15	21.8	16.9	18.02	31.15	30.33	30.45	34.3	37.2	36.4	35.1	39.2	36.9	37.6
Ni	288	334	334	327	315	503	473	499	569	556	595	587	700	670	678
Ga	4.14	4.84	4.8	4.59	4.37	6.65	6.86	6.99	7.58	7.32	7.81	7.84	6.45	6.26	6.45
Rb	0.416	0.128	0.348	0.231	0.184	0.052	0.63	0.054	bdl	1.68	bdl	0.094	0.053	0.045	0.176
Sr	191.2	223.2	213.7	205.5	240.9	148.5	151.3	145.2	144.1	158.9	154.8	148.1	140.4	136	140.5
Y	6.23	7.74	7.45	7.14	10.77	3.21	3.53	3.16	3.18	3.28	3.34	3.27	2.95	2.97	2.96
Zr	104.9	116.5	110.6	110.1	151.7	11.92	20.11	11.7	11.49	13.51	12.15	11.74	9.03	8.78	11.02
Nb	0.548	0.523	0.709	0.413	0.489	0.186	0.262	0.187	0.165	0.722	0.207	0.283	0.173	0.193	0.379
Ba	3.01	1.6	3.94	0.89	1.32	0.418	4.53	0.473	0.324	5.45	0.351	0.603	0.53	0.44	2.15
La	3.1	4.03	4.61	3.3	4.85	2.124	2.258	2.22	2.164	3.32	2.32	2.4	2.2	2.008	2.29
Ce	12.83	17.86	18.58	14.64	21.53	8.43	8.03	8.58	8.76	11.68	9.71	9.88	9.58	8.64	9.26
Pr	2.26	2.94	3.12	2.51	3.75	1.428	1.438	1.427	1.429	1.72	1.549	1.59	1.532	1.413	1.483
Nd	12.41	15.53	16.11	13.4	19.65	7.63	7.32	7.35	7.49	8.69	7.81	8.02	7.64	7.29	7.4
Sm	3.36	3.9	4.09	3.56	5.16	1.83	1.94	1.77	1.84	2.04	1.91	2.08	1.868	1.86	1.92
Eu	1.046	1.235	1.383	1.152	1.654	0.569	0.554	0.546	0.558	0.624	0.606	0.622	0.61	0.587	0.606
Gd	3.22	3.61	3.83	3.3	4.86	1.612	1.73	1.515	1.56	1.68	1.7	1.75	1.64	1.572	1.65
Tb	0.379	0.449	0.446	0.404	0.597	0.183	0.197	0.18	0.183	0.191	0.194	0.195	0.166	0.1725	0.175
Dy	1.9	2.18	2.17	2.04	2.97	0.817	0.957	0.822	0.864	0.93	0.924	0.92	0.771	0.805	0.803
Ho	0.28	0.316	0.309	0.301	0.449	0.1224	0.133	0.1149	0.1226	0.134	0.137	0.129	0.1128	0.1104	0.1112
Er	0.569	0.682	0.61	0.636	0.962	0.268	0.305	0.258	0.279	0.286	0.282	0.28	0.232	0.246	0.235
Tm	0.0551	0.0612	0.0639	0.0601	0.0925	0.0274	0.0307	0.0281	0.0248	0.0295	0.03	0.0298	0.0217	0.0205	0.0243
Yb	0.24	0.275	0.29	0.317	0.468	0.125	0.156	0.142	0.132	0.158	0.114	0.168	0.123	0.125	0.119
Lu	0.0298	0.0344	0.0317	0.031	0.0557	0.014	0.0164	0.0142	0.0148	0.0196	0.0146	0.0141	0.0116	0.0144	0.0154
Hf	5.87	5.81	5.32	6.24	7.37	0.722	0.993	0.713	0.69	0.772	0.72	0.737	0.506	0.51	0.571
Ta	0.0517	0.0426	0.0591	0.0386	0.0542	0.0101	0.018	0.0111	0.0112	0.054	0.0175	0.0211	0.0089	0.0089	0.0228
Th	0.079	0.0481	0.105	0.049	0.087	0.0333	0.049	0.0281	0.0178	0.112	0.0173	0.0313	0.0203	0.035	0.06
U	0.0238	0.0117	0.024	0.0217	0.0273	0.0067	0.0265	0.0062	0.0049	0.0165	0.0058	0.0061	0.0066	0.0071	0.0192

A6.3. Trace-element composition of clinopyroxene in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	28_f_53	28_f_53	28_f_53	28_h_001	28_h_002	28-x-cpx-1	28-x-cpx-2	28-x-cpx-3	30A_a_104	30A_a_105	30A_c_108	30A_c_109	30A_c_109	30A_f_117	30A_f_119
Rock type	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz
Rock microstr.	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Occurrence	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral
Analysed area	core	core	core	garnet rim	core	fine	fine	fine	core	core	core	core	core	core	core
Sc	19.01	20.92	19.89	17.78	23.4	61.7	36.6	40.3	33.24	33.01	33.06	27.06	28.1	34.09	24.55
Ti	1707	1792	1783	1213	3650	5314	4540	4172	1383	1360	1362	1136	1760	1317	1087
V	295.9	325	298.3	252	145	216	177	184	467	479	470	454	315	374	405
Cr	12920	12690	13210	13220	5540	7591	6734	6187	9080	9510	9000	9220	8740	10840	7850
Mn	NA	NA	NA	NA	NA	1225	1205	1100	NA	NA	NA	NA	NA	NA	NA
Co	37.6	40	38.6	32.1	38.2	22.8	22.0	22.8	17.42	18.21	17.65	16.41	23.5	21.24	14.74
Ni	703	742	692	556	369	218	240	240	310.2	328	311.2	310	253	313	270
Ga	6.47	7.11	6.74	5.39	3.71	5.13	4.4	3.99	9.21	9.43	9.25	8.55	4.42	5.63	7.7
Rb	0.099	bdl	0.325	0.46	3.46	0.771	0.369	0.9	0.079	0.555	0.169	bdl	3.54	2	0.212
Sr	139.7	147.5	145.4	100	201	98	106	138	410	408	401	337	307	250	313
Y	3.1	3.42	3.41	0.97	9.3	7.11	7.74	8.19	5.41	5.18	5.43	4.29	5.05	4.43	4.14
Zr	10.42	9.99	10.61	7.04	55.4	85.5	108.2	74.6	70.3	67.3	68.1	59	81.5	55	56.8
Nb	0.388	0.21	0.582	0.71	18	4.8	17.3	7.2	0.389	1.083	0.484	0.308	16.9	1.84	0.341
Ba	1.99	0.355	6.5	5.8	90	9.90	6.37	5.10	1	8.61	2.1	0.75	35.2	9.42	2.57
La	2.086	2.22	2.48	2.06	7.59	4.44	4.91	7.42	10.3	11.37	9.93	12.01	13.11	9.58	10.48
Ce	8.68	9.31	9.37	7.86	23.5	14.58	16.33	22.21	40.7	44	40.8	40.1	39.8	31.1	36
Pr	1.407	1.524	1.494	1.19	3.4	2.52	2.80	3.54	6.14	6.19	6.23	5.48	5.57	4.35	4.95
Nd	7.19	7.72	7.54	5.96	17.3	13.24	13.82	16.62	28.1	27.5	28.1	24	24.4	20	22.13
Sm	1.93	2.11	1.9	1.12	3.86	3.05	3.43	4.24	5.51	5.3	5.44	4.45	4.49	3.93	4.01
Eu	0.583	0.635	0.608	0.291	1.09	0.96	0.99	1.24	1.455	1.429	1.509	1.183	1.189	1.067	1.074
Gd	1.68	1.83	1.74	0.642	3.7	2.55	2.83	2.85	3.73	3.72	4.01	3.11	3.27	2.92	2.89
Tb	0.173	0.195	0.186	0.059	0.434	0.32	0.37	0.42	0.364	0.382	0.407	0.313	0.341	0.315	0.283
Dy	0.855	0.914	0.891	0.238	2.15	1.83	2.09	2.15	1.587	1.586	1.78	1.35	1.482	1.401	1.243
Ho	0.1224	0.131	0.1238	0.0313	0.36	0.30	0.33	0.32	0.218	0.22	0.254	0.1795	0.21	0.184	0.1621
Er	0.257	0.271	0.271	0.075	0.78	0.65	0.71	0.69	0.456	0.459	0.451	0.371	0.452	0.37	0.339
Tm	0.0257	0.0281	0.0268	0.0064	0.102	0.08	0.08	0.08	0.0424	0.0416	0.0434	0.0348	0.042	0.036	0.0307
Yb	0.127	0.138	0.133	0.04	0.61	0.43	0.56	0.45	0.201	0.21	0.233	0.162	0.224	0.172	0.15
Lu	0.0164	0.0169	0.0196	0.0063	0.08	0.07	0.06	0.07	0.0222	0.0201	0.0231	0.0166	0.0281	0.0201	0.0155
Hf	0.59	0.56	0.623	0.337	1.96	4.42	3.99	3.37	2.91	2.95	2.97	2.16	2.98	2.92	2.01
Ta	0.0186	0.0135	0.0308	0.034	0.479	0.34	1.15	0.51	0.0237	0.0549	0.0286	0.0157	0.764	0.13	0.0146
Th	0.0718	0.0203	0.064	0.077	0.9	0.35	0.66	0.82	0.117	0.203	0.136	0.136	1.155	0.39	0.143
U	0.0114	0.0036	0.0143	0.0197	0.041	0.03	0.03	0.02	0.0338	0.0499	0.0398	0.0314	0.139	0.0424	0.0322

A6.3. Trace-element composition of clinopyroxene in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	30A_g_120	30A_h_121	30A_h_121	30A_n_131	30A_n_132	30b-d-42	CAT-18_a_002	CAT-18_a_004	CAT-18_a_003	CAT-18_a_005	CAT-18_b_011	CAT-18_b_012	CAT-18_c_018	CAT-34_c_042	CAT-34_b_036
Rock type	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	high-Mg ecl	high-Mg ecl	high-Mg ecl	high-Mg ecl	high-Mg ecl	high-Mg ecl	low-Mg ecl	low-Mg ecl	low-Mg ecl
Rock microstr.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Occurrence	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	coarse	coarse	fine	fine	fine	fine	fine	coarse	fine
Analysed area	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core
Sc	23.67	40.5	51	29.6	27.96	41.9	17.66	17.25	31.09	19.08	19.19	21.77	19.68	10.2	11.29
Ti	1044	4750	2670	1320	1286	2014	2133	2047	1993	1764	1854	1800	1962	1691	1535
V	427	294	269	451	475	298.5	353	338.6	394	379.2	383	331	333	345.5	358
Cr	8120	11600	10790	10140	11430	10800	369.6	383.2	882	413	440	593	631	476	478
Mn	NA	NA	NA	NA	NA	NA	379.9	392.9	548	471	466.7	658	563	183	192.8
Co	15.26	48.7	23.4	15.79	16.39	22.9	19	18.25	16.88	18.98	18.7	22.5	22.1	25.22	26.1
Ni	284	320	304	290	262	248.9	254.9	245.5	208.6	270.5	255.5	241	249	237.2	246
Ga	7.95	6.7	7.03	8.56	8.42	5.51	16.06	15.32	9.77	12.96	12.83	10.09	9.36	23.87	23.4
Rb	bdl	1.85	1.36	bdl	bdl	3.6	bdl	bdl	0.137	0.152	0.203	7.22	1.85	bdl	0.205
Sr	300	221	169	384	349	299	428	395	517	508	519	477	399	48.1	53.3
Y	3.77	6.57	4.2	4.67	4.4	4.82	2.173	2.12	5.27	3.08	3.18	4.51	3.79	0.455	0.484
Zr	51.2	90.9	69.1	66.4	62.7	67.3	44	42.6	91.3	42.3	53.6	78.7	67.1	11.93	11.31
Nb	0.222	66	12.7	0.359	0.289	7.65	0.809	0.743	1.98	2.92	4.62	30	15.8	0.063	0.189
Ba	0.315	23.1	16.1	0.567	0.366	30.2	0.0021	0.051	6.47	5.36	26.6	97.8	18.5	0.424	0.161
La	10.57	12.1	7.46	11.21	12.89	13.4	16.55	15.39	17.58	25.87	24.62	24.4	15.7	0.175	0.162
Ce	36.4	36.3	22.7	38.9	40.5	35	53.4	50.4	67.6	89	85.5	83.9	60.9	0.69	0.691
Pr	5.02	5.15	3.13	5.78	5.54	4.66	6.81	6.42	8.63	10.87	10.82	10.18	8.04	0.124	0.122
Nd	21.9	23.3	14.5	26.3	24.3	20.2	26.1	25.3	36.5	41.4	42.4	39.5	33	0.707	0.649
Sm	3.88	4.82	2.98	4.95	4.56	3.96	3.64	3.46	6.8	5	5.68	5.92	5.49	0.275	0.296
Eu	1.061	1.29	0.903	1.282	1.192	1.08	0.863	0.838	1.77	1.176	1.28	1.479	1.386	0.111	0.124
Gd	2.69	3.87	2.46	3.51	3.2	3.07	1.72	1.78	3.7	2.62	3.05	3.44	3.1	0.271	0.358
Tb	0.273	0.399	0.29	0.341	0.302	0.334	0.174	0.167	0.391	0.235	0.269	0.35	0.298	0.0278	0.0376
Dy	1.181	1.77	1.3	1.5	1.32	1.44	0.683	0.681	1.62	0.94	1	1.51	1.27	0.125	0.124
Ho	0.153	0.26	0.195	0.199	0.187	0.21	0.093	0.097	0.245	0.147	0.158	0.2	0.191	0.0217	0.0204
Er	0.305	0.538	0.407	0.396	0.359	0.491	0.219	0.197	0.529	0.249	0.3	0.448	0.349	0.026	0.039
Tm	0.0253	0.0514	0.0431	0.0355	0.0318	0.0403	0.018	0.0222	0.0559	0.0224	0.0279	0.0505	0.0428	bdl	0.0053
Yb	0.139	0.258	0.191	0.161	0.158	0.208	0.093	0.071	0.276	0.125	0.121	0.239	0.189	0.0021	0.0009
Lu	0.0138	0.0289	0.0218	0.0178	0.0176	0.0299	0.0059	0.0045	0.0401	0.0078	0.0081	0.0291	0.021	bdl	bdl
Hf	1.69	4.07	4.15	2.68	2.12	3.29	1.561	1.584	3.01	1.686	1.812	2.34	1.91	0.591	0.545
Ta	0.0117	1.92	0.69	0.0217	0.0151	0.474	0.0477	0.0478	0.266	0.233	0.313	1.35	0.841	0.0051	0.0121
Th	0.098	0.583	0.67	0.127	0.163	1.09	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
U	0.0192	0.433	0.079	0.0307	0.0334	0.153	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl

A6.3. Trace-element composition of clinopyroxene in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	CAT-34_c_043	CAT-41_d_090	CAT-41_d_091	CAT-41_d_092	CAT-41_e_093	13_a_005	13_e_027	13_e_028	13_f_029	13_f_030	13_f_031	13_i_038	CAT-26_e_09	CAT-26_e_10	CAT-26_f_11
Rock type	low-Mg ecl	low-Mg ecl	low-Mg ecl	low-Mg ecl	low-Mg ecl	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px	grt-px
Rock microstr.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Occurrence	fine	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	fine	fine	fine
Analysed area	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core
Sc	9.95	9.74	16.62	16.25	16.52	17.59	17.99	17.2	16.35	16.3	17.09	14.95	23.92	23.9	25.12
Ti	3530	1460	1629	1688	1646	1594	1599	1570	1505	1531	1562	1376	778	783	854
V	319	321	492	497	494	162.1	159.9	156.7	150.5	155.8	153.6	146.4	396.3	394.1	424
Cr	429	435	281	282.8	294	1312	1321	1274	1265	1261	1267	1214		417	417
Mn	931	167.7	315	314	327	NA	NA	NA	NA	NA	NA	NA	429	426	431
Co	33.2	23.6	26	25.49	27	44.6	45.3	44	43.4	43.6	43.9	41.3	32.6	33.5	32.3
Ni	331	225	129.3	123.7	134.2	753	754	743	732	729	751	676	479	480	485
Ga	19.08	21.7	26.4	24.57	26.58	5.04	5.15	4.63	4.65	4.91	4.8	4.28	7.87	7.73	8.12
Rb	5.25	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.102	bdl
Sr	108.3	41	75.6	70.2	78.1	165.7	168.2	162.9	159.1	161	165.3	143	203.3	216.3	229
Y	4.06	0.354	1.047	0.972	1.074	0.741	0.711	0.701	0.664	0.68	0.665	0.606	1.475	1.711	1.62
Zr	24.88	9.09	20.37	19.92	19.47	4.19	4.29	4.15	3.89	4.06	4.14	3.23	27.4	28.1	27.8
Nb	24.6	0.0284	0.382	0.216	0.203	0.172	0.158	0.156	0.126	0.145	0.133	0.1	bdl	0.91	0.054
Ba	15.6	bdl	bdl	0.025	bdl	0.534	0.545	0.5	0.479	0.488	0.508	0.394	0.164	8.1	0.163
La	13.2	0.086	0.577	0.538	0.523	2.39	2.51	2.39	2.31	2.34	2.5	1.99	6.47	7.61	10.05
Ce	29.7	0.451	2.78	2.6	2.71	8.46	8.74	8.06	8.18	8.45	8.48	7.18	16	17.55	20.15
Pr	3.45	0.0829	0.482	0.469	0.482	1.296	1.336	1.257	1.243	1.275	1.302	1.08	2.028	2.186	2.27
Nd	13.38	0.478	2.65	2.55	2.67	6.04	6.2	5.91	5.7	5.83	5.88	4.8	8.93	9.23	8.93
Sm	2.51	0.182	0.646	0.66	0.72	1.31	1.35	1.32	1.19	1.29	1.35	1.07	1.69	1.84	1.75
Eu	0.772	0.089	0.21	0.196	0.221	0.399	0.367	0.377	0.359	0.388	0.373	0.297	0.507	0.503	0.538
Gd	1.89	0.22	0.523	0.504	0.47	0.99	0.93	0.824	0.82	0.92	0.96	0.65	bdl	1.17	1.178
Tb	0.216	0.0267	0.0581	0.0586	0.0679	0.062	0.072	0.073	0.068	0.075	0.075	0.053	bdl	0.12	0.129
Dy	1.041	0.109	0.262	0.27	0.308	0.257	0.284	0.241	0.258	0.227	0.214	0.238	bdl	0.615	0.594
Ho	0.152	0.0095	0.0416	0.0396	0.0472	0.0275	0.0268	0.0235	0.0304	0.0312	0.0231	0.0303	0.0696	0.0785	0.0728
Er	0.342	0.0249	0.077	0.073	0.078	0.054	0.062	0.04	0.058	0.074	0.048	0.035	bdl	0.104	0.123
Tm	0.0415	bdl	0.0074	0.0068	0.0041		0.0049	0.0046	0.007	0.0041		0.0036	bdl	0.0186	0.0142
Yb	0.23	0.0159	0.0198	0.029	0.0247	0.0208	0.025	0.0225	0.018	0.0115	0.0174	0.0141	bdl	0.031	0.033
Lu	0.0255	0.00018	0.0031	0.0013	0.0017	0.0022	0.0018	0.00064	0.0015	0.0015	0.004	0.00024	0.003	0.0019	0.0017
Hf	0.826	0.483	0.586	0.624	0.581	0.203	0.229	0.205	0.223	0.229	0.241	0.188	1.241	1.292	1.3
Ta	3.39	0.00151	0.0278	0.0275	0.0301	0.0079	0.0089	0.0129	0.0064	0.0095	0.0083	0.0058		0.045	0.0024
Th	bdl	bdl	bdl	bdl	bdl	0.0193	0.0105	0.0228	0.0202	0.0223	0.0265	0.0135	bdl	bdl	bdl
U	bdl	bdl	bdl	bdl	bdl	0.004	0.0029	0.002	0.00052	0.0017	0.0014	0.0019	bdl	bdl	bdl

A6.3. Trace-element composition of clinopyroxene in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	CAT-26_f_12	CAT-26_f_13	18_c_007	18_c_008	18_j_072	18_j_073	18_j_074	18_j_074	18_x_009	CAT-86_a_070	CAT-86_b_071	CAT-86_b_072	CAT-86_d_079	CAT-94_c_106	CAT-94_c_107
Rock type	grt-px	grt-px	grt-ol-webs?	grt-ol-webs?	grt-ol-webs?	grt-ol-webs?	grt-ol-webs?	grt-ol-webs?	grt-ol-webs?	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.
Rock microstr.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	-	-	-	-	-	-
Occurrence	fine	subhedral	euhedral	euhedral	euhedral	euhedral	euhedral	euhedral	euhedral	coarse	coarse	coarse	fine	coarse	coarse
Analysed area	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core
Sc	24.98	24.58	34.9	34.11	35.3	33.9	37.2	37.2	35.4	11.8	12.56	11.62	26.92	16.5	18.75
Ti	794	797	261.1	329.5	256	235.9	324	281.9	254.9	891	949	929	3030	1428	1741
V	398	399	262.5	262.3	268	263.5	263.5	270	260	137.7	147.5	151.4	266	218	231
Cr	392	395	1586	1601	1640	1605	1607	1638	1602	2396	2563	2640	3830	3680	2660
Mn	413	422	NA	NA	NA	NA	NA	NA	NA	779	788	847	1100	1055	1028
Co	30.1	31.3	28.5	30.31	29.3	29.2	30.7	30.6	29.47	31.63	33.5	34.1	53.6	45.1	41.4
Ni	458	476	282	312.9	269	266.6	296	293	287	479	518	519	680	675	480
Ga	7.91	7.73	4.54	4.87	4.57	4.53	4.95	5	4.48	4.64	4.94	5.01	9.96	7.32	6.89
Rb	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.202	bdl	32.1	bdl	bdl
Sr	207.9	206	78.5	79.2	82.4	78.9	83.9	85.2	84.2	73.3	82.9	78.8	169	109.6	100.4
Y	1.62	1.7	bdl	0.865	0.803	0.767	0.896	0.884	0.796	2.361	2.476	2.68	5.81	3.66	3.85
Zr	27.3	28.5	4.06	4.22	4.2	4.14	4.54	4.87	4.65	4.03	4.39	4.23	53.5	6.59	8.4
Nb	0.053	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.086	0.547	0.094	8.89	0.147	0.164
Ba	0.121	0.1	0.046	0.0495	0.045	0.0277	0.054	0.06	0.048	0.181	0.88	0.181	81.4	0.252	0.53
La	8.69	7.29	2.16	2.243	2.21	2.19	2.44	2.54	2.4	1.118	1.558	1.242	8.33	1.715	1.6
Ce	17.56	16.12	9.36	9.47	9.4	9.09	10.03	10.1	9.82	4.56	5.2	4.84	20.9	6.77	6.31
Pr	2.1	2.13	1.55	1.508	1.56	1.484	1.708	1.72	1.682	0.745	0.834	0.769	3.13	1.101	1.031
Nd	9.04	8.67	7.29	7.43	7.69	7.12	8.23	8.33	8.09	3.42	4.16	4.01	14.24	5.65	5.34
Sm	1.84	1.84	1.58	1.526	1.62	1.51	1.77	1.98	1.64	0.947	1.091	1.17	3.24	1.5	1.34
Eu	0.501	0.518	0.436	0.405	0.466	0.437	0.483	0.485	0.447	0.319	0.389	0.398	0.948	0.455	0.473
Gd	1.19	1.29	1	1.01	1.14	0.97	1.15	1.16	1.2	0.877	0.905	0.871	2.42	1.29	1.31
Tb	0.128	0.133	0.094	0.099	0.097	0.085	0.106	0.097	0.082	0.1016	0.1191	0.118	0.308	0.163	0.166
Dy	0.552	0.582	0.31	0.299	0.301	0.298	0.426	0.333	0.337	0.613	0.67	0.646	1.56	0.908	0.94
Ho	0.0694	0.0804	bdl	0.0332	0.0314	0.0308	0.0445	0.0398	0.0366	0.0842	0.1037	0.095	0.237	0.141	0.165
Er	0.13	bdl	bdl	0.053	0.051	0.057	0.063	0.058	0.057	0.202	0.229	0.219	0.511	0.322	0.354
Tm	bdl	bdl	bdl	0.004	0.0057	0.0027	0.0032	bdl	0.004	0.0224	0.0225	0.02	0.0613	0.0325	0.0365
Yb	0.043	bdl	bdl	0.018	0.0177	bdl	0.0168	0.0175	bdl	0.113	0.129	0.121	0.293	0.166	0.208
Lu	0.0043	bdl	bdl	0.00048	bdl	0.0002	0.00017	0.00023	1.266E-06	0.0133	0.0141	0.0116	0.0344	0.0238	0.0183
Hf	1.304	1.264	0.248	0.284	0.299	0.189	0.248	0.342	0.207	0.232	0.233	0.228	1.92	0.351	0.535
Ta	0.00127	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.00359	0.0111	0.0051	0.532	0.0066	0.0061
Th	bdl	bdl	0.054	0.0624	0.062	0.058	0.069	0.061	0.056	bdl	bdl	bdl	bdl	bdl	bdl
U	bdl	bdl	0.0069	0.0076	0.0076	0.0058	0.0094	0.0084	0.0042	bdl	bdl	bdl	bdl	bdl	bdl

A6.3. Trace-element composition of clinopyroxene in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	CAT-94_c_111	CAT-94_e_116	CAT-94_f_120	CAT-94_d_112	CAT-95_a_054	CAT-95_a_055	CAT-95_c_056	CAT-95_c_057	CAT-97_a_058	CAT-97_a_058	CAT-97_b_059	CAT-97_b_060	CAT-97_d_062	CAT-97_d_063	CAT-97_d_064
Rock type	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.
Rock microstr.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Occurrence	coarse	fine	fine	fine	coarse	coarse	fine	fine	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Analysed area	core	core	core	core	core	core	core	core	core	core	core	core	core	core	core
Sc	18.46	41.1	24	25.48	19.28	15.4	15.59	21	22.06	22.25	21.35	23.1	22.69	22.51	23.04
Ti	1775	2490	1870	3301	1806	1446	1536	2179	1677	2398	2416	2523	2441	2558	2575
V	225.1	286.1	211.5	260.9	232.9	225	235.9	237.6	225.9	314	308	314.4	313.6	320	316
Cr	2950	2920	3650	3094	3090	3790	4050	3908	3810	3290	3190	3267	3244	2466	2370
Mn	939	939	825	1058	1025	975	1002	910	903	1018	964	986	976	1054	1033
Co	41.3	38.7	44.5	44.7	44.1	36.3	38	32.2	32.8	35.6	32.3	32.2	31.64	35.8	34.3
Ni	465	430	812	537	498	446	469	394	412	314	300	310.7	294.6	325	303
Ga	7.13	5.33	6.69	9.06	7.62	6.53	7.03	8.14	7.16	8.71	8.47	8.47	8.08	9.38	8.99
Rb	bdl	19	0.526	16.3	bdl	0.0258	bdl	1.89	1.15	0.058	0.043	0.0329	bdl	bdl	bdl
Sr	94.3	132.6	111.2	163.9	102.5	89.1	92	136.1	118.6	106.2	105	111.6	110.9	116	113.6
Y	3.7	5.72	3.83	5.85	4.09	2.8	2.96	4.04	3.95	3.66	3.75	3.93	3.78	4.18	4.3
Zr	8.84	157.2	12.8	68.4	9.58	6.73	6.98	27.3	26.1	16.9	17.1	17.52	17.34	19.1	18.5
Nb	0.153	6.14	1.85	16.3	0.137	0.134	0.158	4.76	4.25	0.159	0.149	0.17	0.163	0.175	0.201
Ba	0.141	29.8	2.9	97.3	0.254	0.117	0.148	81	29.2	0.208	0.119	0.097	0.126	0.12	0.188
La	1.626	3.75	2.03	7.1	1.553	1.549	1.691	5.98	5.39	1.8	1.75	1.91	1.883	2.09	2.07
Ce	6.26	13.65	7.21	22.32	6.17	6.28	6.39	14.99	12.68	7.86	7.63	7.84	7.37	8.23	8.46
Pr	1.09	2.35	1.27	3.11	1.024	0.983	1.015	2.03	1.65	1.226	1.222	1.291	1.209	1.41	1.427
Nd	5.48	12.36	6.16	13.57	5.59	4.85	5.27	8.9	7.65	6.42	6.48	6.65	6.31	7.45	7.74
Sm	1.54	3.18	1.74	3.2	1.51	1.31	1.23	2.01	1.56	1.75	1.72	1.72	1.72	1.86	2.04
Eu	0.461	0.949	0.469	0.914	0.495	0.389	0.412	0.57	0.497	0.587	0.537	0.599	0.555	0.596	0.613
Gd	1.32	2.49	1.41	2.49	1.48	1.11	1.06	1.51	1.277	1.5	1.46	1.52	1.412	1.72	1.65
Tb	0.188	0.337	0.205	0.31	0.169	0.14	0.137	0.196	0.165	0.196	0.18	0.195	0.19	0.222	0.216
Dy	0.863	1.67	0.917	1.666	0.919	0.773	0.757	1.026	0.923	1.027	1.065	1.047	1.026	1.18	1.129
Ho	0.171	0.285	0.17	0.243	0.168	0.113	0.122	0.166	0.15	0.162	0.149	0.169	0.169	0.188	0.181
Er	0.345	0.559	0.383	0.524	0.421	0.243	0.287	0.381	0.381	0.365	0.325	0.353	0.36	0.409	0.412
Tm	0.0364	0.0551	0.0392	0.0634	0.0393	0.03	0.0369	0.0437	0.0483	0.0411	0.0364	0.0416	0.0407	0.0401	0.0407
Yb	0.18	0.312	0.228	0.319	0.192	0.137	0.161	0.237	0.222	0.202	0.195	0.211	0.158	0.203	0.218
Lu	0.019	0.0416	0.0187	0.0353	0.0231	0.0207	0.0166	0.0304	0.0278	0.0226	0.0195	0.0242	0.0191	0.0291	0.0237
Hf	0.522	5.63	0.688	2.09	0.563	0.441	0.419	0.724	0.749	0.975	0.994	1.012	0.99	1.091	1.15
Ta	0.0092	0.449	0.119	0.893	0.0072	0.0093	0.0093	0.278	0.213	0.0163	0.011	0.0116	0.0122	0.0152	0.0183
Th	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
U	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl

A6.3. Trace-element composition of clinopyroxene in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	20A_b_066	20A_b_067	20A_c_008	20A_c_009	20A_c_012	20A_c_068	20A_c_069	20A_d_070	20A_d_071	20A_e_074	20B_f_026	20B_f_026	20B_e_018	20B_e_018	20B_e_018
Rock type	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.
Rock microstr.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Occurrence	coarse	coarse	coarse	coarse	coarse	coarse	euhedral	euhedral	euhedral	euhedral	subhedral	subhedral	subhedral	subhedral	subhedral
Analysed area	core	core	core	core	core	core	fine	fine	fine	fine	anhedral	anhedral	anhedral	anhedral	anhedral
Sc	41.99	41.49	41.17	40.21	40.68	41.54	43.78	44.25	50.9	44.55	71.5	53.2	83.4	74.9	49
Ti	1689	1684	1646	1628	1639	1659	1850	1706	2920	1650	3400	4260	4750	3900	4060
V	349.7	352.2	348.2	341.7	338.6	336.6	353.5	348.4	319	307.8	208.6	202.6	300.9	261.4	274
Cr	368.5	355.8	368	354.9	334.7	332.3	403.2	412	461	358.9	5270	4960	9160	6090	3380
Mn	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Co	25.34	25.76	25.35	24.72	24.12	24.17	27.68	28.34	26.8	26.68	26.3	27.1	24.64	24.45	25.1
Ni	49.2	46.7	47	47.9	50.4	54.9	90.6	78.1	104.5	79.5	174.2	179	139.6	154.2	188.3
Ga	18.77	19.17	18.58	18.19	18.04	16.88	11.07	11.94	9.7	10.32	4.63	5.12	7.25	5.5	5.9
Rb	bdl	bdl	bdl	bdl	bdl	0.058	6.79	2.33	6.8	7.27	3.5	3.02	0.172	0.48	bdl
Sr	119.2	116.8	118.5	117.3	108.9	117.2	118.6	118.5	199.4	152.3	166	151	81.3	85.1	107.9
Y	5.07	4.99	4.93	4.81	4.7	4.96	4.65	4.74	6.63	5.17	8.48	6.99	7.28	6.78	8.92
Zr	83.8	82.9	82.1	80.3	78.6	83.5	57.4	55.1	69.9	69.6	49.7	62.8	64.3	50.9	60
Nb	0.256	0.264	0.268	0.247	0.256	0.334	2.08	0.8	5.7	4.1	4.7	13.1	0.892	0.88	0.519
Ba	0.108	0.119	0.189	0.107	0.129	1.35	7.78	5.78	23.5	17.5	67.6	57.7	2.75	10.5	0.183
La	2.08	2.097	1.991	2.014	1.995	2.24	3.96	3.85	10.22	6.75	9.13	8.1	3.78	3.66	5.03
Ce	8.96	9.11	8.67	8.67	8.7	8.72	12.98	12.71	28.3	16.6	24.4	21.5	13.48	12.61	19.01
Pr	1.493	1.508	1.42	1.424	1.469	1.451	1.881	1.875	3.99	2.31	3.36	3.04	2.22	2.04	3.06
Nd	8.03	8.04	7.7	7.79	7.57	7.88	9.43	9.55	18.6	10.59	15.5	13.98	11.38	10	15.68
Sm	2.11	2.15	2.02	2.06	2.03	2.134	2.31	2.34	3.67	2.47	3.27	3	2.78	2.69	3.74
Eu	0.718	0.717	0.702	0.703	0.686	0.694	0.746	0.765	1.116	0.767	0.963	0.839	0.883	0.797	1.149
Gd	2.05	2.03	1.88	1.94	1.895	1.95	2.01	2.17	3.21	2.35	2.86	2.65	2.46	2.47	3.09
Tb	0.254	0.267	0.236	0.248	0.238	0.265	0.246	0.266	0.391	0.285	0.375	0.297	0.333	0.287	0.422
Dy	1.335	1.371	1.234	1.294	1.282	1.341	1.243	1.312	1.83	1.452	1.89	1.56	1.74	1.59	2.15
Ho	0.218	0.202	0.197	0.196	0.212	0.217	0.2	0.208	0.284	0.227	0.325	0.282	0.273	0.259	0.34
Er	0.475	0.485	0.44	0.468	0.457	0.481	0.421	0.443	0.631	0.516	0.812	0.617	0.713	0.696	0.869
Tm	0.0482	0.0473	0.0457	0.0444	0.0456	0.051	0.0407	0.0403	0.0647	0.0499	0.093	0.0721	0.0839	0.0801	0.1
Yb	0.254	0.246	0.241	0.251	0.276	0.26	0.218	0.233	0.416	0.258	0.569	0.448	0.422	0.433	0.562
Lu	0.0273	0.0245	0.0272	0.0296	0.0276	0.0316	0.0274	0.0262	0.0463	0.0332	0.069	0.0606	0.0635	0.0552	0.0685
Hf	5.84	5.97	5.33	5.56	5.73	5.77	4.46	4.56	5.15	5.36	2.37	2.63	3.75	2.85	3.04
Ta	0.0322	0.0327	0.0342	0.0345	0.0344	0.0426	0.105	0.0602	0.321	0.248	0.305	0.73	0.17	0.112	0.081
Th	0.0217	0.0202	0.0236	0.0209	0.0231	0.0314	0.142	0.12	0.503	0.55	0.498	0.601	0.121	0.138	0.071
U	0.0065	0.0039	0.0052	0.0072	0.0061	0.0112	0.0781	0.0341	0.088	0.133	0.101	0.166	0.0223	0.0194	0.007

A6.3. Trace-element composition of clinopyroxene in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	20B_c_010	20B_c_010	20B_c_010	20B_b_007	20B_b_007	20B_a_003	20B_a_003	20B_a_003	20B_c_014	20B_c_014	20B_a_005	20B_a_005	1-f-152	1-f-155	1-f-156
Rock type	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.
Rock microstr.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Occurrence	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	euhedral	euhedral	euhedral
Analysed area	core	core	core	core	core	core	core	core	fine	fine	fine	fine	anhedral	anhedral	anhedral
Sc	40.7	39.9	42.1	42.49	43.8	45.7	45.4	46.4	43	40.1	36.1	38.2	15	15.09	15.63
Ti	1703	1640	1606	1657	1628	1671	1757	1812	6740	1961	2950	3180	1238	1206	1274
V	362.9	352	347.3	343.5	343.7	346	354	364	296.7	320	255.8	233	190.2	193.3	194.5
Cr	304.3	322	318	329.8	333.6	380	374	405	528	436	4800	1641	3073	3177	3159
Mn	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Co	24.94	25.6	25.7	23.77	24.32	24.8	24.32	25.9	31.3	27	25.99	25.6	39.6	40.6	40.9
Ni	62.7	62.3	73.2	61.3	59.8	62.2	64.6	68.4	122.2	120.2	234.5	152.5	599	612	599
Ga	17.3	18.7	15.99	16.95	16.88	17.14	17.13	18.22	7.73	8.73	5.02	5.05	6.09	6.41	6.27
Rb	bdl	bdl	0.105	bdl	bdl	bdl	bdl	bdl	2.1	0.65	0.203	1.08	0.0314	bdl	bdl
Sr	109.3	108.5	111.6	104.4	107.4	113.7	113.9	121	202	134.3	160.8	175.8	101.1	97.3	99.7
Y	5.05	4.93	5.29	4.66	4.82	5.02	5.39	5.3	7.71	6.15	8.02	7.05	3.54	3.47	3.62
Zr	89.3	87.5	86.3	79.2	81.7	83.7	87.8	89.1	119	47.9	36.8	58.1	6.09	5.77	6.31
Nb	0.5	0.329	0.296	0.299	0.251	0.253	0.27	0.299	44.5	0.622	0.427	8.6	0.128	0.105	0.127
Ba	0.48	0.531	2.48	0.344	0.094	bdl	0.108	0.118	87.1	11	4.55	37	0.295	0.265	0.274
La	1.955	2.01	2.13	1.799	1.772	1.9	1.99	1.98	15.3	5.91	6.77	9.73	1.658	1.671	1.677
Ce	8.49	8.64	8.51	8.02	8.02	8.39	8.28	8.66	39.9	19.8	25.9	28.4	6.69	6.62	6.33
Pr	1.458	1.47	1.483	1.395	1.387	1.44	1.478	1.59	4.8	2.93	3.98	4.02	1.008	0.996	0.987
Nd	7.77	7.68	7.8	7.18	7.17	7.7	8.12	8.06	20.4	13.83	19.2	18.2	5.41	5.06	5.1
Sm	2.12	2.04	2.12	1.91	1.96	2.13	2.06	2.17	3.83	3.12	4.17	3.83	1.454	1.41	1.407
Eu	0.668	0.685	0.663	0.663	0.737	0.711	0.697	0.668	1.099	0.871	1.293	1.165	0.465	0.436	0.444
Gd	1.99	1.8	2.04	2.02	1.9	2.14	1.89	2.17	3.28	2.57	3.85	3.54	1.332	1.27	1.29
Tb	0.246	0.272	0.245	0.254	0.248	0.254	0.284	0.271	0.395	0.31	0.405	0.397	0.184	0.171	0.155
Dy	1.38	1.32	1.3	1.358	1.32	1.5	1.48	1.43	1.9	1.53	2.23	1.78	0.918	0.824	0.866
Ho	0.223	0.221	0.216	0.214	0.202	0.203	0.233	0.216	0.319	0.25	0.335	0.298	0.1386	0.146	0.145
Er	0.531	0.52	0.506	0.448	0.433	0.476	0.49	0.453	0.734	0.575	0.799	0.699	0.31	0.326	0.362
Tm	0.0507	0.0436	0.0513	0.044	0.0538	0.0469	0.055	0.0509	0.079	0.0639	0.093	0.0768	0.0336	0.0322	0.0365
Yb	0.293	0.264	0.251	0.233	0.251	0.233	0.257	0.268	0.403	0.318	0.517	0.401	0.184	0.164	0.195
Lu	0.0297	0.0286	0.0292	0.0221	0.0304	0.0265	0.0285	0.0315	0.0517	0.0371	0.0594	0.04	0.0219	0.019	0.0174
Hf	6.35	6.17	6.08	5.75	6.07	6.09	6.55	6.79	6.25	3.44	2.14	3.18	0.304	0.297	0.349
Ta	0.0387	0.0351	0.0424	0.0334	0.0341	0.0396	0.0385	0.0402	1.91	0.06	0.0384	0.465	0.0049	0.006	0.0025
Th	0.0197	0.0279	0.061	0.0206	0.0215	0.0159	0.0254	0.0183	0.98	0.177	0.082	0.517	0.0109	0.0147	0.0117
U	0.0049	0.0037	0.0104	0.0069	0.0043	0.0048	0.0045	0.0046	0.324	0.0226	0.0065	0.079	0.00094	0.0014	0.0007

A6.3. Trace-element composition of clinopyroxene in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	1-f-152	1-f-155	1-f-156	1-f-152	1-f-155	35_a_032	35_a_032	35_a_033	35_b_037	35_b_038	35_b_038	35_f_047	35_f_047b	35_f_048	35_f_048
Rock type	cpx meg.	cpx meg.	cpx meg.	cpx meg.	cpx meg.	granulite?	granulite?	granulite?	granulite?	granulite?	granulite?	granulite?	granulite?	granulite?	granulite?
Rock microstr.	-	-	-	-	-	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Occurrence	euhedral	euhedral	euhedral	euhedral	euhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral	anhedral
Analysed area	anhedral	anhedral	anhedral	anhedral	anhedral	core	core	core	core	core	core	core	core	core	core
Sc	15.26	14.91	15.26	15.28	17.36	119.4	106.9	117.2	119	113.8	121.7	123.9	119.9	117.6	84.2
Ti	1277	1198	1282	1315	1320	2490	1408	1589	1469	3740	1393	1653	1201	1359	1354
V	190.3	190	191.4	193	191.6	321.3	397.9	311.1	337.8	424	343	403	271.9	277.8	313
Cr	3111	3080	3103	3251	3280	103.9	115.1	100.6	130.6	133.2	130.3	130	90.5	86.6	76.3
Mn	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Co	40.1	39.1	40.5	42	39.8	54.1	51.6	56.6	51.9	51.1	54	49.8	57.5	52.8	50.6
Ni	597	597	589	611	610	89	84.7	86.2	73.6	83.4	81.2	86.7	88.7	87.9	103.9
Ga	6.09	6.3	5.68	6.25	6.16	16.51	19.2	19.19	16.37	18.23	16.88	20.9	17.28	17.87	22.3
Rb	bdl	bdl	bdl	bdl	1.43	bdl	0.024	bdl	bdl	bdl	bdl	bdl	0.047	bdl	bdl
Sr	100.7	98	98.9	102.1	133.5	44.8	36.5	53.6	45.9	42.8	46.3	42.7	59.6	69.4	67
Y	3.78	3.4	3.62	4.03	4.34	12.72	10.83	12.4	21.04	17.42	21.94	16.61	15.9	10.82	8.47
Zr	6.21	5.98	6	6.6	6.98	165.7	160.7	148.5	162.5	186.3	166.1	182	140	128.4	84.8
Nb	0.114	0.122	0.117	0.104	2.02	0.331	0.0178	0.0254	0.107	0.97	0.044	bdl	0.0413	0.039	0.0281
Ba	0.299	0.295	0.268	0.285	7.42	0.51	0.37	0.38	0.13	0.385	0.158	0.114	0.73	0.122	0.142
La	1.662	1.623	1.632	1.725	3.17	5.45	4.73	5.32	5.13	5.04	5.5	4.49	5.63	6.3	4.69
Ce	6.64	6.39	6.24	6.38	9.2	28.8	28	28.8	27.7	28.2	29.5	27.6	29.8	32.8	28.6
Pr	1.039	1.032	0.99	1.071	1.49	5.75	5.72	5.95	5.55	5.88	6.16	5.93	5.9	6.6	6.01
Nd	5.6	4.99	5.28	5.45	7	32.7	32.5	33.6	31.8	34.3	35.1	35.5	33	36	33.9
Sm	1.45	1.32	1.39	1.45	1.77	8.89	8.89	9.33	9.24	9.36	10.34	10.2	8.68	9.09	8.72
Eu	0.452	0.448	0.462	0.444	0.535	1.85	1.87	1.86	1.844	1.924	1.97	1.9	1.73	1.81	1.76
Gd	1.34	1.34	1.36	1.57	1.68	7.15	6.66	6.66	7.87	7.72	8.78	8.15	6.98	6.79	6.32
Tb	0.174	0.16	0.168	0.167	0.204	0.833	0.753	0.748	1	0.932	1.085	0.934	0.841	0.716	0.644
Dy	0.865	0.894	0.91	1.02	1.091	3.79	3.45	3.42	5.3	4.61	5.71	4.49	4.14	3.35	2.78
Ho	0.15	0.142	0.149	0.164	0.168	0.558	0.468	0.523	0.903	0.76	0.956	0.697	0.699	0.469	0.373
Er	0.341	0.308	0.338	0.361	0.413	1.127	0.883	1.079	2.11	1.605	2.17	1.49	1.54	0.968	0.707
Tm	0.0328	0.032	0.0327	0.0329	0.0421	0.1047	0.0798	0.0987	0.213	0.159	0.22	0.143	0.152	0.0813	0.0614
Yb	0.184	0.178	0.185	0.195	0.236	0.47	0.369	0.472	1.133	0.81	1.116	0.723	0.716	0.382	0.296
Lu	0.02	0.0197	0.0202	0.0218	0.0326	0.0538	0.0421	0.0534	0.136	0.0957	0.135	0.0835	0.0843	0.0512	0.0342
Hf	0.383	0.308	0.283	0.335	0.372	5.72	6.11	5.43	5.49	6.86	6.04	7.26	5.09	5.5	4.4
Ta	0.0049	0.001	0.0018	0.0016	0.096	0.019	0.0042	0.0038	0.0072	0.0394	0.0039	0.0026	0.0056	0.0006	0.006
Th	0.0055	0.0122	0.011	0.0144	0.224	0.0465	0.0256	0.0283	0.0326	0.0414	0.0279	0.0267	0.0449	0.0139	0.0497
U	0.00037	0.00027	bdl	0.001	3.84	0.0043	bdl	0.00039	bdl	bdl	bdl	0.00114	0.0022	bdl	0.00104

A6.3. Trace-element composition of clinopyroxene in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	44_c_129	44_d_131	44_e_134	44_e_135	44_f_136	44_g_138	44_g_139
Rock type	H-metasom.	H-metasom.	H-metasom.	H-metasom.	H-metasom.	H-metasom.	H-metasom.
Rock microstr.	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Occurrence	subhedral	subhedral	subhedral	subhedral	subhedral	subhedral	subhedral
Analysed area	core	core	core	core	core	core	core
Sc	42.3	41.4	40.6	42.1	39.1	42.5	43.6
Ti	1218	1191	1195	1222	1027	1157	1277
V	308.6	317.8	312	313.3	239	294.7	315
Cr	821	834	926	910	782	977	915
Mn	NA	NA	NA	NA	NA	NA	NA
Co	23.8	23.74	24.09	22.92	37.2	23.67	24.3
Ni	97.3	96.1	97	93.3	328	88.9	95.8
Ga	13.27	13.31	13.89	13.44	10.51	12.56	14.02
Rb	bdl	bdl	0.061	bdl	10.3	bdl	bdl
Sr	142.8	143.3	134.3	144.6	90.4	130.4	147.8
Y	5.16	4.83	5.15	5.38	4.54	5.09	5.42
Zr	75.8	75.5	79.2	87	75.3	80.5	86.4
Nb	0.232	0.244	0.193	0.227	0.979	0.214	0.244
Ba	0.133	0.13	0.173	0.132	1.203	0.143	0.119
La	2.8	2.6	2.23	2.43	1.53	1.98	2.43
Ce	11.7	11.25	9.62	10.58	6.01	8.72	10.33
Pr	2.01	1.906	1.724	1.86	1.088	1.58	1.81
Nd	10.11	9.85	9.19	9.92	6.53	8.42	9.68
Sm	2.64	2.33	2.52	2.67	1.66	2.28	2.58
Eu	0.736	0.787	0.785	0.823	0.588	0.719	0.825
Gd	2.25	2.15	2.38	2.32	1.77	2.22	2.48
Tb	0.278	0.252	0.263	0.316	0.251	0.294	0.308
Dy	1.43	1.37	1.53	1.54	1.21	1.42	1.48
Ho	0.218	0.21	0.231	0.254	0.171	0.238	0.256
Er	0.474	0.462	0.479	0.549	0.408	0.498	0.52
Tm	0.0481	0.0549	0.043	0.0514	0.0422	0.047	0.0534
Yb	0.256	0.227	0.257	0.252	0.198	0.254	0.28
Lu	0.0242	0.0256	0.0269	0.0312	0.0259	0.0237	0.0269
Hf	5.17	4.92	5.27	6.15	5.38	5.54	5.74
Ta	0.0224	0.0219	0.0245	0.0277	0.089	0.027	0.0306
Th	0.0229	0.0236	0.0221	0.0169	0.038	0.0146	0.0192
U	0.0052	0.0074	0.0076	0.0026	0.213	bdl	0.0061

A6.3. Trace-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	30A_j_125	30A_j_125	30A_j_125	30A_l_128	30A_l_128	30A_l_128	30A_l_128	31_i_102	31_i_102	31_i_102	31_n_119	31_n_119	31_n_119	34_g_024
rock type	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Wehr
rock microstr.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
area	rim	core	core	core	core	core	core	core	core	core	core	core	core	core
Sc	78.1	71.3	75.5	75.2	70.3	76.4	78.7	92.6	100.1	91.1	87.0	86.5	91.7	101.0
Ti	1438	1355	1607	1735	1820	1972	1901	792	861	738	775	737	729	804
V	227.3	192.4	235.1	253	250.7	268	249.4	209.8	224	204.1	201	198.1	199.1	225.5
Cr	17840	18320	18890	19800	18760	20200	18600	24800	27400	25360	24400	24200	24940	29200
Mn	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Co	39.9	42.5	38.6	40	38.4	39	38.3	43	45.6	41.5	40.5	41	41.1	33.2
Ni	31.8	31.9	35.7	34.4	31	29	33.8	20	21.7	21.4	18.4	20.5	20	19.8
Ga	10.47	10.02	10.47	11.8	10.96	10.3	10.33	7.61	7.76	7.58	7.11	7.15	7.29	4.06
Rb	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Sr	0.262	0.224	0.139	0.17	0.13	0.14	0.145	0.129	0.104	0.098	0.124	0.131	0.131	0.366
Y	15.84	17.18	14.39	14.4	13.73	14.7	14.82	13.14	13.73	12.31	11.8	11.63	12.71	7.24
Zr	34.6	41.3	32.6	34.6	33.6	35.4	35.9	11.48	11.56	10.05	10.11	9.84	9.81	9.79
Nb	0.077	0.089	0.087	0.071	0.0485	bdl	0.063	0.101	bdl	0.072	bdl	bdl	bdl	0.205
Ba	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
La	0.0208	0.0145	0.0121	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.078
Ce	0.274	0.256	0.16	0.169	0.1228	0.158	0.154	0.203	0.176	0.154	0.191	0.208	0.171	0.848
Pr	0.0927	0.0871	0.0544	0.0609	0.0478	0.0608	0.0572	0.0776	0.0722	0.0645	0.077	0.0834	0.0726	0.244
Nd	0.901	0.884	0.624	0.66	0.605	0.65	0.651	0.861	0.841	0.703	0.84	0.865	0.67	1.84
Sm	0.798	0.795	0.659	0.695	0.637	0.764	0.758	0.586	0.596	0.509	0.506	0.592	0.507	0.905
Eu	0.394	0.406	0.33	0.336	0.325	0.363	0.35	0.267	0.294	0.251	0.243	0.26	0.251	0.361
Gd	1.64	1.8	1.42	1.39	1.426	1.52	1.592	1.186	1.24	1.096	0.97	1.04	1.12	1.14
Tb	0.321	0.362	0.3	0.299	0.273	0.31	0.322	0.239	0.263	0.228	0.226	0.255	0.235	0.21
Dy	2.55	2.85	2.33	2.28	2.21	2.4	2.44	1.95	2.23	1.92	1.79	1.91	1.9	1.32
Ho	0.562	0.628	0.533	0.488	0.492	0.532	0.556	0.471	0.507	0.449	0.414	0.428	0.457	0.26
Er	1.82	1.99	1.65	1.59	1.53	1.68	1.85	1.42	1.5	1.433	1.37	1.34	1.47	0.82
Tm	0.267	0.294	0.239	0.232	0.226	0.242	0.255	0.195	0.233	0.196	0.178	0.202	0.207	0.119
Yb	1.79	2.02	1.7	1.72	1.638	1.86	1.89	1.46	1.56	1.391	1.36	1.41	1.58	0.9
Lu	0.268	0.306	0.266	0.259	0.239	0.266	0.31	0.209	0.228	0.214	0.197	0.221	0.237	0.14
Hf	0.421	0.446	0.544	0.635	0.643	0.714	0.67	0.211	0.207	0.17	bdl	bdl	bdl	0.2
Ta	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Th	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.0476
U	0.0508	0.0417	0.0354	0.039	0.0304	bdl	0.0357	0.0324	0.0345	0.0199	bdl	bdl	bdl	0.135

A6.3. Trace-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	34_g_024	34_g_024	34_g_024	34_j_041	34_j_041	37_a_004	37_a_004	37_a_004	37_b_115	37_b_115	37_b_115	40B	40B	40B
rock type	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Hz	grt-Hz	grt-Hz
rock microstr.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
area	core	core	core	core	core	core	core	core	core	core	core	core	core	core
Sc	98.7	105.1	100.0	98.3	97.2	119.2	111.1	119.7	123.1	116.6	123.7	114.9	119.5	118.5
Ti	727	766	724	667	682	1908	1680	1896	1826	1849	1570	1285	1200	1248
V	216	223	218.5	218.2	220.3	134.5	137.7	136.2	140.6	140.3	136	345.9	369.8	361.2
Cr	28500	28600	27980	29100	29000	46600	47000	47300	66200	64800	66700	30380	29990	30560
Mn	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Co	33.5	34	33.4	33.5	33.1	41	41.4	40.8	41.8	40.7	41.7	46.2	46.9	47.5
Ni	19.3	17.9	17.1	18.2	16.3	29.2	25.1	25.1	29.2	33.7	37.8	63.9	65.3	66
Ga	3.94	3.88	3.95	4.69	4.38	5.09	4.62	5.02	5.02	5	4.96	10.08	10.42	10.42
Rb	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Sr	0.222	0.227	0.256	0.255	0.192	0.386	0.396	0.43	0.539	2.7	0.427	0.282	0.309	0.299
Y	7.17	7.22	7.24	6.77	6.93	30.9	29.2	34.1	26.29	27.2	12.4	6.58	6.61	6.59
Zr	9.48	10.07	9.42	8.56	8.54	111.8	99.3	116.2	107.5	105.7	71.8	16.12	10.15	13.4
Nb	bdl	bdl	bdl	0.092	bdl	0.24	0.228	0.228	0.289	0.242	bdl	0.24	0.259	0.281
Ba	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
La	bdl	0.0462	0.0454	0.0437	0.0328	0.0294	0.0302	0.0259	0.032	0.073	bdl	bdl	bdl	0.0152
Ce	0.537	0.608	0.584	0.467	0.42	0.44	0.433	0.395	0.528	0.739	0.436	0.221	0.209	0.242
Pr	0.195	0.213	0.204	0.144	0.138	0.159	0.149	0.147	0.191	0.206	0.162	0.0712	0.0704	0.0806
Nd	1.69	1.88	1.73	1.209	1.307	1.76	1.504	1.7	2.12	2	1.8	0.752	0.617	0.726
Sm	0.869	0.866	0.784	0.681	0.803	1.83	1.41	1.74	2.05	1.88	1.76	0.479	0.317	0.446
Eu	0.34	0.308	0.345	0.294	0.291	0.951	0.842	0.983	1.095	1.091	0.975	0.201	0.148	0.202
Gd	1.15	1.15	1.21	1.04	1	4.14	3.51	4.07	4.42	4.18	3.21	0.748	0.618	0.655
Tb	0.199	0.188	0.192	0.193	0.161	0.812	0.704	0.843	0.831	0.811	0.486	0.138	0.1228	0.126
Dy	1.18	1.25	1.26	1.155	1.15	5.73	5.23	6.05	5.34	5.36	2.68	1.047	1.026	1.001
Ho	0.249	0.269	0.254	0.238	0.26	1.126	1.055	1.209	0.954	0.993	0.422	0.236	0.238	0.238
Er	0.772	0.83	0.85	0.707	0.732	3.06	3.12	3.3	2.33	2.58	1.07	0.813	0.854	0.829
Tm	0.123	0.118	0.103	0.101	0.102	0.382	0.391	0.41	0.286	0.308	0.123	0.121	0.131	0.128
Yb	0.887	0.965	0.887	0.79	0.868	2.44	2.57	2.73	1.809	2.08	0.918	0.917	1.029	1.052
Lu	0.145	0.171	0.151	0.134	0.139	0.364	0.392	0.381	0.251	0.282	0.138	0.169	0.177	0.173
Hf	0.195	bdl	0.21	0.157	0.185	1.28	1.18	1.48	1.227	1.164	0.758	0.293	0.331	0.37
Ta	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.0253	bdl	bdl	bdl	bdl	0.0252
Th	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
U	0.099	0.11	0.118	0.093	0.101	bdl	bdl	bdl	bdl	0.0345	bdl	bdl	bdl	bdl

A6.3. Trace-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	40B	40B	10_a_085	10_a_085	10_a_086	10_g_119	10_g_119	10_g_119	12_d_087	12_d_087	12_d_087	12_d_087	12_j_097	12_j_097
rock type	grt-Hz	grt-Hz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz
rock microstr.	coarse	coarse	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared
area	core	core	core	core	core	core	rim	core	core	core	core	core	core	core
Sc	119.1	114.7	146.4	106.8	113.5	110.1	111.1	115.3	173.5	172.7	168.4	165.0	175.2	172.9
Ti	1435	1931	4850	5730	5970	6070	5860	6140	5350	6110	6230	5720	9170	9420
V	334.3	259.9	372	356	377	386	371	408	523	545	521	510	520	515
Cr	31380	31190	56400	28720	46800	30600	28810	31710	60700	63600	60400	59700	69300	69800
Mn	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Co	48.7	48.6	48.9	47.5	47.2	50.6	48.5	51.8	49.3	52.2	48.8	48.2	57.9	59
Ni	66.7	68.7	98.6	94.7	94	106.4	96.8	106.5	126.1	128.3	121.8	116.2	142.5	141
Ga	9.69	8.16	9.76	13.55	12.33	15.37	14.26	15.42	6.51	7.38	7.48	6.65	10.33	11.16
Rb	bdl	bdl	bdl	bdl	bdl	bdl	bdl	1.66	bdl	bdl	bdl	bdl	bdl	bdl
Sr	0.269	0.312	0.708	0.8	bdl	0.527	0.482	4.07	0.923	0.958	0.883	0.9	1.107	1.168
Y	6.99	8.37	5.55	20.01	17.4	22.17	22.04	22.66	4.46	8.36	9.62	6.99	19.08	20.55
Zr	17.45	33	55.6	74.7	74.4	82.8	81.8	83.1	86	99.6	104.4	97	113.2	115.9
Nb	0.261	0.274	0.301	0.241	bdl	0.256	0.237	0.292	0.39	0.396	0.425	0.456	0.514	0.482
Ba	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
La	0.0177	0.0141	0.0422	0.0323	bdl	0.0295	0.0246	0.0695	bdl	0.075	0.08	0.055	0.081	0.08
Ce	0.231	0.231	0.52	0.375	0.583	0.374	0.352	0.465	0.825	0.843	0.838	0.788	1.016	1.02
Pr	0.0815	0.08	0.177	0.127	0.163	0.125	0.1206	0.1282	0.27	0.296	0.286	0.259	0.352	0.35
Nd	0.811	0.844	1.77	1.227	1.59	1.26	1.251	1.346	2.94	2.91	2.8	2.72	3.26	3.37
Sm	0.53	0.679	1.42	1.003	1.37	1.109	1.126	1.157	2.22	2.08	2.22	2.06	2.07	2.13
Eu	0.218	0.317	0.547	0.555	0.686	0.553	0.574	0.582	0.892	0.936	0.957	0.952	1.089	1.057
Gd	0.74	1.164	1.411	2.24	2.37	2.31	2.32	2.41	2.43	3.24	3.33	3.12	3.56	3.59
Tb	0.145	0.219	0.178	0.426	0.455	0.461	0.497	0.475	0.253	0.411	0.524	0.414	0.616	0.7
Dy	1.119	1.47	0.996	3.47	3.21	3.58	3.69	3.61	1.14	2.07	2.47	1.75	4.08	4.02
Ho	0.249	0.307	0.179	0.764	0.656	0.801	0.84	0.836	0.159	0.295	0.363	0.276	0.598	0.626
Er	0.832	0.964	0.567	2.47	1.97	2.6	2.63	2.69	0.397	0.747	0.865	0.646	1.373	1.5
Tm	0.1226	0.1267	0.0888	0.347	0.257	0.367	0.363	0.39	0.0527	0.0765	0.1	0.0699	0.155	0.184
Yb	1.01	1.004	0.707	2.47	1.7	2.68	2.54	2.73	0.425	0.56	0.631	0.567	1.03	1.077
Lu	0.155	0.169	0.1103	0.374	0.25	0.39	0.384	0.427	0.088	0.102	0.102	0.083	0.146	0.147
Hf	0.328	0.443	0.919	1.88	1.74	1.84	1.98	1.83	1.5	1.93	2.11	2.12	2.12	2.16
Ta	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.0484	0.0365
Th	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
U	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.0281	bdl

A6.3. Trace-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	12_j_098	24A	24A	24A	24A	24A	24A	24A	24A	28_a_076	28_a_076	28_b_38	28_b_38	28_e_48
rock type	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz
rock microstr.	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared
area	core	core	core	core	core	core	core	core	core	core	core	core	core	core
Sc	158.4	163.0	158.2	153.2	177.1	148.9	152.3	179.3	166.8	114.6	111.1	129.6	133.6	145.5
Ti	8280	1843	1948	2385	2716	2534	2343	2554	2579	7300	7400	7430	7510	6700
V	545	486	489	481	474	488	474	481.2	481	444	452	491	486	534
Cr	72200	53100	52100	55700	54200	55500	53300	52400	54400	73400	78800	92800	89200	64400
Mn	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Co	60.6	44.2	41.8	44.3	44.2	44.8	44.3	44.2	44.8	46.1	50.6	51.6	51.6	52.5
Ni	136	98.3	95	99	100.4	103.7	99	99.2	102.8	1160	bdl	bdl	bdl	128.3
Ga	8.89	5.75	5.62	6.11	5.94	6.19	6.1	6.11	6.22	12.57	13.97	13.32	13.04	10.05
Rb	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Sr	0.972	0.771	0.773	0.708	0.734	0.721	0.684	0.869	0.814	0.924	1.082	1.01	0.949	1.099
Y	12.57	4.15	3.93	6.87	8.18	7.12	6.84	8.55	7.52	23.13	24.3	21.85	22.97	13.55
Zr	96.4	19.69	23.6	39.8	47.7	41.2	41.9	52.1	46	103.1	105.5	107.1	113	95.4
Nb	0.486	0.534	0.511	0.563	0.532	0.542	0.519	0.563	0.561	0.413	0.454	0.442	0.446	0.461
Ba	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
La	0.078	0.079	0.0755	0.0719	0.0772	0.0674	0.0724	0.076	0.0761	0.0745	0.0795	0.0764	0.0695	0.0736
Ce	0.99	0.976	0.867	0.876	0.892	0.895	0.882	0.881	0.863	0.799	0.89	0.888	0.844	0.849
Pr	0.321	0.317	0.284	0.274	0.322	0.296	0.293	0.31	0.296	0.247	0.267	0.275	0.281	0.255
Nd	2.86	2.82	2.69	2.58	3.08	2.74	2.77	3.07	2.95	2.39	2.62	2.73	2.55	2.45
Sm	1.83	0.957	1.182	1.37	1.66	1.548	1.59	1.83	1.571	2.01	1.91	2.07	2.12	1.94
Eu	0.936	0.305	0.346	0.479	0.616	0.561	0.566	0.619	0.554	0.923	0.94	1.041	0.997	0.982
Gd	3.08	0.85	0.9	1.53	1.89	1.59	1.66	1.89	1.575	3.65	3.78	3.77	3.74	3.11
Tb	0.515	0.12	0.127	0.219	0.272	0.223	0.219	0.269	0.241	0.674	0.665	0.629	0.639	0.478
Dy	2.69	0.797	0.79	1.37	1.59	1.375	1.343	1.639	1.466	4.46	4.45	4.17	4.19	2.82
Ho	0.406	0.168	0.161	0.248	0.292	0.252	0.25	0.308	0.272	0.848	0.819	0.759	0.817	0.435
Er	0.869	0.457	0.44	0.719	0.813	0.676	0.729	0.868	0.729	2.364	2.29	2.26	2.15	1.097
Tm	0.103	0.0672	0.0629	0.0974	0.1003	0.0855	0.0936	0.1131	0.101	0.286	0.268	0.276	0.275	0.124
Yb	0.677	0.518	0.532	0.725	0.704	0.622	0.643	0.882	0.728	1.844	1.84	1.78	1.77	0.879
Lu	0.1051	0.089	0.0956	0.116	0.1208	0.1061	0.1061	0.14	0.1213	0.238	0.245	0.25	0.253	0.132
Hf	1.71	0.393	0.439	0.927	1.038	0.814	0.967	1.155	0.946	2.59	2.27	2.21	2.28	1.98
Ta	0.0404	0.0572	0.0496	0.0449	0.0595	0.0453	0.0494	0.057	0.0568	0.034	0.0303	0.0325	0.0387	bdl
Th	bdl	bdl	bdl	bdl	bdl	bdl	0.0201	bdl	bdl	bdl	bdl	bdl	bdl	bdl
U	0.031	0.0428	0.0474	0.0456	0.0465	0.045	0.0494	0.042	0.042	0.0342	0.0423	0.0432	0.0422	0.0317

A6.3. Trace-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	28_e_48	28_h_084	28_h_084	28_h_084	32B_b_039	32B_b_039	32B_c_040	32B_c_040	32B_c_040	32B_f_055b	32B_f_055b	32B_f_055b	13_a_007	13_d_024
rock type	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-px	grt-px
rock microstr.	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	sheared	coarse	coarse
area	core	core	rim	rim	core	core	core	core	core	core	core	core	core	core
Sc	135.1	142.1	152.0	140.9	89.0	83.0	135.5	131.5	126.5	147.1	147.1	145.4	97.5	93.1
Ti	6890	6030	6230	6160	2356	2696	5020	4430	4940	5480	5450	5880	6070	5900
V	542	503	550	509	270.9	252	458	426	456	466	458	482	313	309
Cr	63300	65500	68300	64800	14490	13610	34700	35700	37200	52400	50800	52500	7040	7410
Mn	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Co	55.2	50.5	53.4	54.2	42.5	44	42.2	42.2	42.1	45.6	43.2	44.4	69.3	71.5
Ni	142.9	117.3	122.3	123.3	85.9	83.3	82.3	80.2	81.6	118.3	116.3	120.8	156	157
Ga	11.68	13.12	12.56	12.61	9.08	8.54	6.42	5.48	6.42	7.17	6.86	7.73	12.86	14
Rb	0.66	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Sr	1.8	0.827	0.858	0.785	0.545	0.502	0.761	0.74	0.809	0.894	0.817	0.893	0.99	1.08
Y	15.56	7.11	6.34	6.84	5.78	6.07	10.48	6.02	9.2	12.63	11.27	14.92	13.14	13.4
Zr	98.8	77.1	81	76.5	18.3	25.6	76.6	66.4	75.1	92	83.8	96.6	59.4	62.2
Nb	1	0.459	0.466	0.479	0.257	0.22	0.403	0.384	0.389	0.415	0.419	0.418	0.478	0.484
Ba	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
La	0.129	0.0755	0.0772	0.0768	0.0346	0.0228	0.0631	0.0664	0.0599	0.0693	0.0654	0.0701	0.083	0.103
Ce	1.06	0.932	0.91	0.853	0.378	0.361	0.75	0.729	0.754	0.764	0.768	0.819	1.009	1.04
Pr	0.289	0.296	0.296	0.278	0.1159	0.1035	0.238	0.222	0.243	0.259	0.251	0.275	0.296	0.3
Nd	2.62	2.86	2.71	2.8	1.072	0.989	2.26	2.14	2.35	2.69	2.56	2.84	2.86	2.97
Sm	2.03	1.69	1.73	1.58	0.614	0.682	1.73	1.484	1.78	2.02	1.93	2.18	1.97	1.94
Eu	0.992	0.635	0.638	0.652	0.236	0.277	0.827	0.733	0.795	0.934	0.884	1.004	0.91	0.93
Gd	3.15	1.77	1.69	1.88	0.596	0.808	2.84	2.33	2.77	3.32	3.1	3.68	2.41	2.65
Tb	0.52	0.235	0.244	0.237	0.0932	0.1175	0.417	0.327	0.437	0.531	0.476	0.607	0.301	0.351
Dy	3.14	1.34	1.3	1.31	0.734	0.779	2.19	1.375	2.13	2.79	2.56	3.55	2.29	2.35
Ho	0.533	0.217	0.218	0.226	0.197	0.181	0.362	0.183	0.325	0.439	0.398	0.569	0.469	0.532
Er	1.394	0.659	0.571	0.666	0.672	0.665	0.807	0.442	0.687	1.021	0.925	1.381	1.55	1.77
Tm	0.168	0.0838	0.0733	0.092	0.119	0.113	0.095	0.0567	0.08	0.1207	0.111	0.153	0.212	0.229
Yb	1.215	0.761	0.676	0.729	0.967	0.892	0.727	0.44	0.557	0.815	0.735	0.994	1.55	1.6
Lu	0.169	0.12	0.104	0.145	0.164	0.155	0.1151	0.078	0.0909	0.1259	0.114	0.14	0.2	0.229
Hf	1.93	1.52	1.53	1.41	0.319	0.408	1.52	1.21	1.54	1.99	1.86	2.1	1.13	1.22
Ta	0.0474	0.0461	0.0449	bdl	bdl	bdl	0.0338	0.0353	0.0305	0.0354	0.0361	0.0402	bdl	bdl
Th	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
U	0.0458	0.0383	0.0424	0.0425	bdl	bdl	0.0323	0.0252	0.0353	bdl	0.0351	0.0331	bdl	bdl

A6.3. Trace-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	13_d_024	13_d_024	13_g_033	13_g_033	CAT-18_b_006	CAT-18_b_006	CAT-18_d_020	CAT-18_d_020	CAT-18_f_025b	CAT-34_a_028	CAT-34_b_039	CAT-34_c_041b	CAT-34_f_044	CAT-46_b_086
rock type	grt-px	grt-px	grt-px	grt-px	grt-px	ecl	ecl	ecl	ecl	ecl	ecl	ecl	ecl	ecl
rock microstr.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
area	core	core	core	core	100.44	100.44	100.93	100.93	100.04	100.39	100.63	100.69	99.85	100.54
Sc	92.9	93.7	99.5	102.5	32.1	32.3	33.4	33.8	33.7	38.4	41.0	42.3	42.2	42.5
Ti	5660	5780	6290	6330	908	831	661	798	648	1100	1114	1109	1091	811
V	301	295	308	320	59.6	53.6	46.1	52.4	45.9	101.7	101.1	97.4	105.7	111.5
Cr	6810	6620	8100	8390	247.7	333.2	271	314.6	274.8	452	406.1	394.5	413	187.4
Mn	NA	NA	NA	NA	2495	2706	2524	2679	2559	2058	2088	2075	2094	2272
Co	67.4	64.8	66.9	65.8	52.5	55.4	54.6	55.2	54.8	58	60.8	62.8	59.4	54.3
Ni	149.8	145.3	142	148	16.82	17.72	15.7	15.83	15.13	24.1	31.1	29.4	24.9	7.63
Ga	12.73	11.97	12.06	12.3	8.67	7.97	7.61	8.45	7.1	10.2	10.96	10.78	11.09	10.24
Rb	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Sr	1.017	0.993	1.04	1.12		0.07	0.082		0.097	0.318	1.66	0.286	0.314	0.259
Y	13.41	13.04	11.8	12.75	7.54	7.5	8.75	8.7	9.49	18.5	19.44	20.47	23.4	21.87
Zr	57.8	60.4	68.2	75.9	10.14	8.61	8.3	9.25	8.59	11.56	11.16	12.07	12.32	8.92
Nb	0.503	0.495	0.43	0.54	bdl	bdl	bdl	bdl	bdl	bdl	0.24	bdl	bdl	bdl
Ba	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
La	0.084	0.091	0.089	0.11	bdl	bdl	bdl	bdl	bdl	bdl	0.212	bdl	bdl	bdl
Ce	0.985	1.025	0.97	1.1	0.0475	0.06	0.101	0.067	0.119	0.0521	0.487	0.0539	0.0519	0.1
Pr	0.295	0.301	0.318	0.349	bdl	bdl	bdl	bdl	0.0374	bdl	0.068	bdl	bdl	0.0431
Nd	2.61	2.69	2.75	3	0.277	0.327	0.367	0.344	0.36	0.489	0.511	0.368	0.375	0.587
Sm	1.97	1.91	2.17	2.24		0.264	0.266	0.297	0.359	0.872	0.733	0.679	0.965	0.781
Eu	0.819	0.91	0.86	0.94	0.122	0.123	0.171	0.148	0.179	0.644	0.544	0.504	0.682	0.533
Gd	2.46	2.53	2.82	3.32	0.537	0.534	0.544	0.615	0.661	2.39	2.36	2.18	2.84	2.22
Tb	0.37	0.344	0.413	0.406	0.12	0.13	0.139	0.138	0.165	0.508	0.511	0.493	0.602	0.494
Dy	2.48	2.47	2.5	2.5	1.199	1.174	1.313	1.208	1.39	3.61	3.59	3.81	4.58	3.83
Ho	0.556	0.521	0.456	0.528	0.341	0.318	0.347	0.357	0.336	0.709	0.788	0.798	0.945	0.849
Er	1.76	1.56	1.48	1.5	1.169	1.172	1.163	1.106	1.102	1.883	2.24	2.3	2.49	2.33
Tm	0.243	0.218	0.192	0.194	0.205	0.187	0.204	0.184	0.197	0.269	0.314	0.312	0.343	0.313
Yb	1.83	1.61	1.6	1.58	1.33	1.352	1.5	1.46	1.39	1.76	2.27	2.37	2.21	2.45
Lu	0.244	0.193	0.237	0.214	0.185	0.195	0.215	0.23	0.209	0.219	0.299	0.307	0.305	0.318
Hf	1.16	1.21	1.49	1.52	0.161	0.125	0.109	0.099	0.078	0.146	0.158	0.165	0.188	0.089
Ta	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Th	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
U	0.0349	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl

A6.3. Trace-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	CAT-46_c_087	CAT-46_f_096	CAT-46_f_096	18_a_001	18_a_066	18_h_021	18_h_021	18_h_021	18_h_021	CAT-26_1	CAT-26_2	CAT-26_3	CAT-26_4	MGR-35_1
rock type	ecl	ecl	ecl	grt-ol-webs?	grt-ol-webs?	grt-ol-webs?	grt-ol-webs?	grt-ol-webs?	grt-ol-webs?	grt-px	grt-px	grt-px	grt-px	grt-px
rock microstr.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
area	100.68	100.81	100.81	core	core	core	core	core	core	core	core	core	core	core
Sc	41.6	45.3	43.6	176.1	175.6	163.9	183.6	173.4	159.8	68.9	69.6	68.9	68.2	59.0
Ti	736	1062	782	328	420	823	553	542	681	924	986	813	880	218
V	109.1	79.2	112.2	260	266.9	265	262.7	258.5	259.3	188.2	202	173.9	179.6	72.5
Cr	185.7	190	198.5	5800	5560	6270	6500	6280	6150	780	811	763	775	1.16
Mn	2163	2546	2205	NA	NA	NA	NA	NA	NA	2502	2564	2557	2525	4612
Co	54.1	53.3	56.2	65.8	65.1	64.5	64.7	64	63.4	65.3	66.3	68.5	67.9	60.6
Ni	8.01	7.08	8.59	11.4	11.4	11.2	9.3	9.6	9.89	32	32.5	33	33.4	2.64
Ga	10.1	9.14	10.75	10.77	10.25	9.53	10.48	10.19	9.7	10.56	10.93	10.24	10.48	15.1
Rb	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.0213	0.173
Sr	0.203	0.223	0.242	bdl	bdl	bdl	bdl	bdl	bdl	0.041	0.074	0.052	0.057	2.5
Y	21.33	23.34	21.34	15.47	15.38	16.52	17.28	16.1	16.04	10.44	10.6	10.91	10.13	115.3
Zr	5.69	16.46	6.3	10.66	11.52	14.56	13.35	12.66	13.69	24.3	24.24	23.34	22.65	12.3
Nb	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.0189	0.013	0.0147	bdl	0.0115
Ba	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.217
La	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.0022	bdl	bdl	bdl	0.696
Ce	0.101	0.103	0.087	0.0493	0.056	0.089	0.0576	0.066	0.0875	0.0544	0.0463	0.0505	0.045	2.678
Pr	0.0418	0.0485	0.0437	0.0267	0.0297	0.0457	0.0336	0.0368	0.0429	0.0164	0.0167	0.0131	0.0177	0.36
Nd	0.6	0.661	0.626	0.411	0.503	0.682	0.495	0.504	0.58	0.249	0.207	0.254	0.237	2.64
Sm	1.047	0.74	0.928	0.594	0.594	0.699	0.75	0.766	0.756	0.258	0.283	0.273	0.281	4.7
Eu	0.649	0.481	0.6	0.36	0.412	0.439	0.497	0.42	0.42	0.177	0.172	0.173	0.172	1.843
Gd	2.33	2.05	2.41	1.72	1.88	1.86	1.87	1.81	1.92	0.744	0.773	0.805	0.746	12.68
Tb	0.511	0.488	0.502	0.366	0.343	0.381	0.403	0.352	0.367	0.182	0.188	0.202	0.196	2.676
Dy	3.92	3.85	3.76	2.6	2.79	2.77	3.04	2.93	2.91	1.68	1.72	1.73	1.74	20.41
Ho	0.855	0.866	0.819	0.54	0.583	0.585	0.644	0.599	0.607	0.403	0.419	0.423	0.428	4.21
Er	2.41	2.59	2.52	1.66	1.8	1.804	1.94	1.82	1.84	1.19	1.218	1.258	1.24	11.84
Tm	0.353	0.357	0.347	0.235	0.238	0.25	0.274	0.257	0.245	0.203	0.201	0.206	0.196	1.742
Yb	2.37	2.39	2.3	1.6	1.79	1.72	1.89	1.71	1.68	1.37	1.342	1.41	1.322	11.49
Lu	0.312	0.315	0.308	0.251	0.268	0.258	0.272	0.262	0.228	0.195	0.201	0.196	0.191	1.569
Hf	0.073	0.145	0.077	bdl	bdl	0.342	0.238	0.188	0.373	0.364	0.343	0.283	0.308	0.148
Ta	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Th	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
U	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl

A6.3. Trace-element composition of garnet in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl. NA stands for "not analysed"

Label	MGR-35_2	MGR-35_3
rock type	grt-px	grt-px
rock microstr.	coarse	coarse
area	core	core
Sc	62.7	50.1
Ti	233	209
V	63.3	93.5
Cr	<0.54	22.95
Mn	4899	4552
Co	67.7	64.7
Ni	1.84	5.03
Ga	16.08	17.68
Rb	0.124	0.311
Sr	<2.43	<2.39
Y	69.2	85.07
Zr	13.93	5.82
Nb	0.0093	0.0235
Ba	0.404	0.255
La	0.252	0.0964
Ce	0.77	0.297
Pr	0.141	0.0705
Nd	2.09	1.322
Sm	4.17	3.51
Eu	1.802	1.594
Gd	12.28	9.16
Tb	2.358	1.996
Dy	14.26	15.08
Ho	2.392	3.14
Er	4.95	8.97
Tm	0.596	1.18
Yb	3.88	7.46
Lu	0.389	0.977
Hf	0.18	0.15
Ta	bdl	bdl
Th	bdl	bdl
U	bdl	bdl

A6.3. Trace-element composition of chromite in the mantle xenoliths sampled by Cat115 kimberlite. Data in ppm. Values below detection limit are represented with <

Element	10-a-91	10-a-90	10-g-120	10-g-122	11-a-2	11-b-x	11-b-y	11-b-z	11-b-v	11-a-01	11-a-02	11-a-03	12-d-89
Rock type	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	spl-Hz	spl-Hz	spl-Hz	spl-Hz	spl-Hz	spl-Hz	spl-Hz	spl-Hz	grt-Hz
Occurrence	garnet rim (inside)	garnet rim (inside)	garnet rim (inside)	garnet rim (inside)	interstitial	interstitial	interstitial	interstitial	interstitial	interstitial	interstitial	interstitial	garnet rim
Core/rim	core	rim	core	rim	core	core	core	core	core	core	core	core	core
Ca	43700	86100	2248	4010	12.7	569	<13.85	799	2213	36.5	619	515	6160
Sc	50.6	123.2	8.14	4.72	0.108	0.141	0.136	0.203	0.425	0.110	0.866	0.190	39.7
Ti	9570	7640	3350	3710	27.9	33.5	29.0	30.8	36.1	27.0	34.5	31.6	25900
V	656	313.8	400	452	332	385	341	384	424	356	378	388	213.8
Cr	85100	28060	61000	77000	78200	92500	80700	89900	102100	81700	91000	87300	19100
Mn	2248	2627	899	1106	560	678	612	647	709	596	726	642	5100
Co	87.7	38.2	62.5	78.7	251.7	305.2	289.5	314.1	371	281.5	315.6	314.8	57.6
Ni	241.3	85.3	180.6	230.9	497	562	528	551	689	494	595	594	524
Zn	171.3	24.4	56.0	106.0	845	1179	1010	1222	1573	949	1152	1206	40.4
Ga	35.4	12.35	18.67	28.10	12.76	14.16	13.50	14.10	18.33	12.36	15.73	14.97	35.8
Y	10.80	21.44	1.02	1.217	<0.0042	0.0110	<0.0062	0.0106	0.0470	<0.0047	<0.0063	0.0137	7.74
Zr	97.3	126.6	3.74	13.95	0.060	0.335	0.024	0.275	0.884	0.038	0.245	0.282	116.1
Nb	13.32	9.96	0.313	2.83	0.0366	0.0432	0.0209	0.052	0.076	0.0370	0.0689	0.0556	103.9
Sn	1.76	1.32	<0.28	0.648	0.299	0.737	0.234	1.21	2.26	<0.155	1.073	0.751	1.92
Hf	2.409	3.19	0.142	0.312	<0.0104	0.0169	<0.0137	<0.0164	0.0142	<0.0140	<0.0091	0.0220	1.64
Ta	0.795	0.582	0.018	0.162	<0.0067	<0.0062	<0.0071	<0.0097	<0.0074	<0.0101	<0.0066	<0.0118	1.94
U	0.280	0.221	0.025	0.0755	0.0077	0.0242	<0.0058	0.0252	0.0979	0.0032	0.0551	0.0260	1.775

A6.3. Trace-element composition of chromite in the mantle xenoliths sampled by Cat115 kimberlite. Data in ppm. Values below detection limit are represented with <

Element	12-d-91	12-d-91b	28-a-104	28-a-105	32b-g-45	32b-g-46	32b-g-48	34-c-16	37-a-7	37-a-6	37-a-79	37-a-84
Rock type	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr
Occurrence	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim (inside)	garnet rim	garnet rim	garnet rim	garnet rim
Core/rim	core	core	core	core	core	core	core	core	rim	core	core	core
Ca	424	2766	1516	444	<35.94	69800	161	1569	1827	173	342	3380
Sc	4.66	5.56	6.23	3.08	4.43	160.6	7.31	13.29	11.13	0.41	1.28	17.60
Ti	4960	6060	5910	4830	2355	4790	2213	3110	22150	476	1637	10360
V	569	625	487	398	439	543	460	379	1217	53.6	148.8	925
Cr	117400	135300	96800	76800	82500	71600	88300	56300	380000	12850	52500	326000
Mn	921	977	1462	1033	1015	2082	1382	1477	2800	159.5	369	3330
Co	96.7	114.1	67.5	56.0	60.3	64.3	68.9	87.3	248.3	11.46	33.2	237.4
Ni	464	620	148.9	131.7	161.8	177.8	174.8	144.8	1516	38.9	143.6	1020
Zn	210.0	235.2	34.1	27.9	66.0	78.4	87.4	87.9	847	29.8	95.6	798
Ga	29.9	32.0	20.16	16.53	11.26	15.41	14.86	20.1	84.2	4.73	8.26	58.9
Y	0.234	0.166	0.699	0.099	<0.0287	17.42	0.230	3.13	0.93	0.296	0.211	3.25
Zr	2.57	2.84	4.10	0.74	0.55	99.0	12.16	19.8	38.2	1.84	1.38	27.6
Nb	0.616	0.397	0.543	0.179	0.093	2.12	0.357	2.51	15.13	1.43	0.329	2.27
Sn	0.56	0.94	0.83	<0.39	<0.43	1.07	1.12	0.76	1.16	0.61	<0.20	3.03
Hf	0.086	0.119	0.125	0.100	<0.042	3.35	0.154	0.327	1.11	0.038	0.071	0.594
Ta	0.057	0.053	0.052	0.079	<0.023	0.448	<0.029	0.052	1.21	0.036	<0.0134	0.434
U	0.0168	<0.0103	0.027	<0.0096	<0.014	0.050	<0.021	0.138	0.130	0.022	0.0186	0.226

A6.3. Trace-element composition of phlogopite in the mantle xenoliths sampled by the Angolan kimberlites. Data in ppm. Values below detection limit are represented with bdl

Label	28_m_049	28_m_051	28_m_051	28_m_051	13_f_014	13_b_21	34_d_053	34_d_053	34_d_055	34_d_055	CAT-34_a_030	CAT-34_a_033	CAT-34_g_047	30A_b_062
Rock	grt-Hz	grt-Hz	grt-Hz	grt-Hz	grt-px	grt-px	grt-Wehr	grt-Wehr	grt-Wehr	grt-Wehr	low-Mg ecl	low-Mg ecl	low-Mg ecl	grt-Lhz
Rock microstr.	sheared	sheared	sheared	sheared	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Occurrence	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	garnet rim	metasom.
zone	core	core	core	core	core	core	core	core	core	core	core	core	core	core
Sc	bdl	6.42	6.61	0	14	0	2.29	1.71	1.78	1.93	3.03	2.22	2.21	2.51
Ti	19200	bdl	23900	24100	12300	0	3550	1706	1610	1610	5660	4027	3944	3638
V	bdl	bdl	bdl	227	146.2	410	73.9	35.13	33.32	33.73	63	56	51.8	59.5
Cr	bdl	bdl	bdl	19000	1800	9980	91.5	89.1	86.5	87.2	1884	1773	1710	1868
Mn	bdl	bdl	bdl	207	407	1960	287	266.9	281.7	313.4	251	167.9	167.4	148.4
Co	bdl	bdl	bdl	50.2	63.7	92.3	62.3	66	65.8	66.9	47.2	55.1	51.8	57.3
Ni	bdl	bdl	893	676	879	266	208.7	204.2	204.4	207	1122	1461	1446	1729
Ga	18.9	21.6	19.9	24.2	18.5	4.4	63.9	61.5	58.9	58.6	27.3	33.09	32.9	37.15
Rb	bdl	bdl	511	435	246	49.6	808	783	752	747	397	457	457	483
Sr	bdl	bdl	bdl	46.4	93.4	231	0	0	2.57	4.63	29.6	14.68	20.5	24.3
Y	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Zr	bdl	bdl	bdl	bdl	36.4	bdl	17.1	3.37	3.24	4.98	bdl	bdl	bdl	bdl
Nb	bdl	bdl	bdl	22.5	17.6	bdl	0	4.36	4.06	4.02	bdl	7.12	6.91	6.99
Cs	bdl	bdl	bdl	2.16	1.66	bdl	4.95	4	3.91	4.02	5.47	6.69	6.95	7.67
Ba	bdl	bdl	bdl	1266	944	bdl	378	184.7	170.3	170.7	873	999	992	1070

Label	30A_b_062	30A_f_068	30A_g_072	30A_h_081	30A_h_081	30A_i_083	30A_m_091	30A_b_066	30A_b_066	30A_f_069	30A_g_074	30A_g_077	30A_i_085	30A_j_087
Rock	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz	grt-Lhz
Rock microstr.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
Occurrence	metasom.	metasom.	metasom.	metasom.	metasom.	metasom.	metasom.	metasom.	metasom.	metasom.	metasom.	metasom.	metasom.	metasom.
zone	core	core	core	core	core	core	core	rim	rim	rim	rim	rim	rim	rim
Sc	2.59	2.48	2.65	3.03	2.22	2.21	2.19	5.86	6.5	7.8	5.06	2.41	2.42	6.13
Ti	3906	3735	3561	5660	4027	3944	4270	16790	19590	14760	13110	4260	5090	15230
V	63.1	61.4	60.7	63	56	51.8	63.4	312	327.8	248.9	204	60.3	68.8	233.4
Cr	1999	1855	1856	1884	1773	1710	2090	7230	8190	6220	8710	2000	2271	13970
Mn	133.5	128.4	123.5	251	167.9	167.4	129.9	221.4	269	338	273	144.2	124.1	190.5
Co	59.7	55.1	53.2	47.2	55.1	51.8	59.2	63	61.6	56.8	59.5	50.2	50.1	53.2
Ni	1910	1812	1724	1122	1461	1446	1776	1593	1422	1186	1570	1432	1413	1052
Ga	39.4	35.3	34.2	27.3	33.09	32.9	36.9	29.7	29.19	23.59	29.4	30.6	31.4	23.86
Rb	548	494	456	397	457	457	566	608	566	432	545	396	466	455
Sr	15.57	15.21	14.08	29.6	14.68	20.5	12.99	bdl	30.6	32.5	bdl	13.92	13.27	19.42
Y	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Zr	bdl	bdl	bdl	bdl	bdl	bdl	1.91	8.32	10.19	16.9	10.61	bdl	bdl	9.48
Nb	7.67	6.6	5.96		7.12	6.91	5.91	20.2	26.17	19.97	16.6	7.48	7.46	25.8
Cs	8.5	7.86	6.91	5.47	6.69	6.95	8.89	4.31	3.31	2.93	4.63	4.73	6.65	2.96
Ba	1109	1013	1036	873	999	992	1018	676	744	635	817	928	909	785

CHAPTER 7.
STRUCTURE OF THE SCLM BENEATH LUNDA NORTE: A THERMOBAROMETRIC APPROACH

APPENDIX

The 3-layer model used in this thesis for the calculation of the local geotherm was modified from that of Hasterok and Chapman (2011). However, in this case the parameters involved in the equations were adapted to those that are more likely to be found in the SCLM beneath the Lunda Norte province. I would like to particularly acknowledge the contribution of Dr. Salvador Galí in the development of this model.

A7.1.1. Calculation of the P-T of equilibration of the peridotite xenoliths

There is great deal of thermobarometers that can be used to estimate the T,P equilibrium parameters for peridotites. They have been reviewed, tested and often redesigned or reformulated through multiple linear regressions over a variety of compositions of natural and synthetic samples (See for instance Finnerty and Boyd, 1984; Brey and Köhler, 1990; Nimis and Grüter, 2010).

Initially the procedure for evaluating T and P consisted of pairing almost every thermometer and barometer found in the literature to solve a system of two (non-linear) equations with a mathematical solver (from Mathematica, Mathcad or similar). This procedure provides fifteen different solutions that provide a straightforward but crude picture visualized as a cloud of points in the T,P space. Clustering of several points with low dispersion gives it was considered the "best" estimated temperature and pressure. The *a posteriori* analysis of the adequacy of each thermobarometer usually finds a plausible explanation on the basis of composition, temperature and pressure ranges recommended for each combination.

The list of selected thermometers and barometers and the phases involved are given in the following table:

Thermometers	**Description**	**Code**
Brey and Köhler 1990	Compositions of coexisting Opx-Cpx	BKT
Brey and Köhler 1990	Ca in Opx	NaT
Brey and Köhler 1990	Partioning of Na between Opx-Cpx	CaT
Nimis and Taylor, 2000	Enstatite in Cpx	NTT
O'Neil and Wood, 1979	Kd of Fe/Mg in coexisting Grt-Ol	O'NT
Barometers		
Brey and Köhler 1990	Al in coexisting Opx-Grt	BKB
Macgregor, 1974	Al in enstatite	MGB
Nimis and Taylor, 2000	Cr in Cpx	NTB

The resulting possible combinations of thermometers and barometers are:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Therm	BKT	BKT	NTT	NTT	BKT	NaT	NaT	CaT	CaT	NaT	CaT	O'NT	O'NT	O'NT	NTT
Barom	BKB	MGB	NTB	BKB	NTB	NTB	BKB	NTB	BKB	MGB	MGB	NTB	MGB	BKB	MGB

To elucidate the reason why a given thermobarometer is efficient, in the sense of accuracy of the estimated T and P, would represent an exhaustive analyses of the basis on which the thermometer/barometer has been built (theoretical assumptions, experimental calibration multi regression analyses, etc.). This is a job out of the scope of this thesis. However, some conclusions were achieved.

1. Thermometers NaT and CaT are the simplest and the most successful. Based only in the distribution of Na between Opx and Cpx, or Ca in Opx, once calibrated, appear to be friendly and robust. Thermometer BKT is also robust, but includes an empirical correction for Fe, whose efficiency depends on the Fe content. NTT thermometer shows a tendency to underestimate temperatures, but no simple explanation for this behavior can be inferred from inspection of our limited set of samples. O'NT usually overestimates temperatures, the reason being the distribution of Fe between Fe2+ and Fe^{3+}?

2. Among the barometers accepted, MGB and NTB give comparable results when combined with the same thermometer, with a mean difference of 3.53 kb. The estimated pressures using MGB are always greater than those obtained with NTB. The coincident results given by the two barometers increases the confidence on them when estimating T and P of xenoliths where the results are greatly dispersed for the fifteen combinations essayed, or when only one or two phases are clean enough, or unaltered, to be analyzed.

3. The BKT barometer is complex in the sense that depends on many variables derived from analytical results, and on assumed methods of calculation of structural formulas. For instance, the method of calculating the Al in the M1 site due to Tschermak's component may lead to contradictory results (Al much bigger than Ca in Tschermak's component) that limit the consistency of this barometer. With only one exception, BKB underestimates pressure, with respect the accepted values.

A7.1.2. Estimation of dP/dT and dz/dT and minimum lithospheric thickness from xenoliths

The above results show an approximate linear dependence between temperature on pressure (or depth) (fig. A7.1). This linear regression will be subsequently used to constrain the family of conductive geotherms under the Lunda Norte kimberlite province. In figure A7.1, T and P previously estimated are represented in P-T space and linear regression P = a+b·T will be used to introduce the dependence of thermal conductivity on Z :

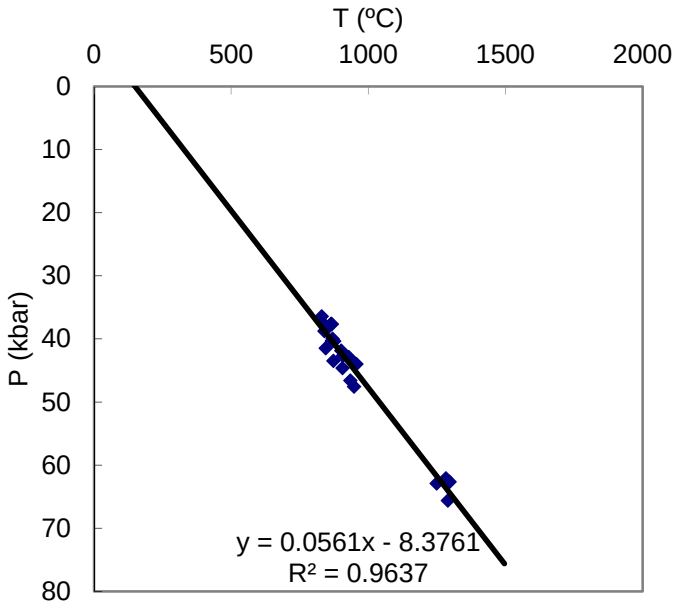


Figure A7.1. PT diagram showing the equilibration conditions of the peridotite xenoliths when using the "best" estimates after the geothermobarometric calculations described above. They show a good linear correlation that can be used to define the model.

Linear regression of the best estimations give P = 0.0561-8.3761, and

$$T(P) = \frac{1}{0.561} \cdot P + \frac{8.3761}{0.0561} \qquad \text{(P in kb and T in °C)}$$

And given that pressure is a function of thicknesses and densities of layers,

$$P(Z) = (D1 \cdot g \cdot (\rho 1 - \rho 3) + D2 \cdot g \cdot (\rho 2 - \rho 3) + Z \cdot \rho 3 \cdot g) \cdot 10^{-5}$$

where Di and ρi stand for thicknesses and densities, g is the gravity constant and Z the depth.

Then:

$$T(Z) = \frac{1}{0.561} \cdot P(Z) + \frac{8.3761}{0.0561}$$

The total thermal (see Artemieva and Mooney, 2002) lithospheric thickness according to maximum P estimated in xenoliths is greater than 200 km. In the next, a thickness of near 240 km will be justified.

A7.1.3. Definition of the 3-layer model

The cratonic lithosphere model used to calculate the geotherms beneath the Lundas Norte province is based on a three-layer model (two different crustal layers and one lithospheric mantle layer beneath), characterised by different heat production contributions and tectono-thermal constraints (fig. A7.2).

Surface 0	Z0				Q0	T0
Upper Crust Layer 1		D1	A1	K1		ρ1
Surface 1	Z1=D1				Q1	T1
Lower Crust Layer 2		D2	A2	K2		ρ2
Surface 2	Z2=D1+D2				Q2	T2
Lithospheric mantle Layer 3		D3	A3	K3		ρ3
Surface m	Zm=D1+D2+D3				Qm	Tm

Figure A7.2: Scheme of the three-layer model used to calculate the geotherms. **Thickness:** D1, D2, …, Dn, with Di the thickness (positive) between depth Z_{i-1} and Zi (depth is computed as a positive quantity) Unit: **meters. Heat production:** Ai is the heat produced in layer Di. Unit **wat·m^{-3} Thermal conductivity:** Ki is the thermal conductivity in layer Di. Unit: **wat·m^{-1}·C^{-1}.** For the lithospheric mantle, Ki is dependent on temperature. **Heat flow:** Q0, Q1, …Qm, where Q0 is the earth surface heat flow (level Z0), and Qm is the heat flow in the boundary asthenosphere-lithosphere (conventionally, the level at the intersection of the geotherm and a 1300 °C at the surface adiabat). Qi is then the heat flow at the base of layer "i", the sign being positive. For a three layer model (upper crust, lower crust and lithospheric mantle) four values are obtained: Q0, Q1, Q2 and Qm. Only Q0 can be measured or fitted. Unit: **wat·m^{-2} Temperatures**: T_0,T_1,….T_m are temperatures at the surfaces limiting layers. (T_0 = 25°C), Tm>1300 °C . Unit: **°C Densities:** ρ1, ρ2, …ρn, are densities of layers D1, D2,…Dn. Unit: **kg·m^{-3}**

Provided this region is devoid of seismic tomography, electrical conductivity and heat flow measurements, these parameters are compared to those reported by Artemieva (2006). Table A7.1 defines the parameters involved in this modelling, as well as the value chosen for each one in this work. For comparison purposes, the table also includes the values proposed by other authors. The premises under which each value was chosen is explained next.

parameters		value	units	reference
$?_{298}$	estimated conductivity of a lherzolite at 298K and 1 bar	3.8	W/mK	-
a	is a fitting parameter which depends on bulk composition	0.35	-	-
?	Gruneisen constant for a lherzolite	1.2	-	-
α	thermal expansion	$2.0 \cdot 10^{-5}$	-	-
K0	bulk modulus	$261 \cdot 10^{9}$	Pascal	-
dK0	derivative of bulk modulus with respect the pressure	5	-	-
P	mean pressure	$5.212 \cdot 10^{9}$	Pascal	-

g	gravity constant	9.8	m/s^2	-
ρ1	density of upper crust	2700	kg/m^3	Artemieva, 2006
ρ2	density of lower crust	2800	kg/m^3	Rudnik et al., 1998
ρ3	density of lithospheric mantle	3300	kg/m^3	Artemieva, 2006; Rudnik et al., 1998
D1	thickness of upper crust	23000	m	-
D2	thickness of lower crust	17000	m	-

T0	**temperature at the surface**	**25**	**ºC**	-
$T2=T_{moho}$	temperature at the crust-mantle boundary	300-500ºC	ºC	Jaupart & Mareschal, 2005
	temperature at the crust-mantle boundary	**364ºC**	**ºC**	**this work**
Tm	**temperature at 240 km for a 32mW/m² geotherm**	**1481**	**ºC**	**this work**
	adiabatic gradient	0.3-0.5	ºC/km	Rudnik et al. 1998
	adiabatic gradient	**0.4**	**ºC/km**	**this work**

Q0	**heat flow at the surface**	**30-34**	**mW/m^2**	**this work**
	heat flow at the surface (mean value for Archean)	38-45	mW/m^2	Artemieva, 2006
	heat flow at the surface (mean value for Archean)	41	mW/m^2	Rudnik et al., 1998
	heat flow at the surface (mean value for Proterozoic)	48±0.08	mW/m^2	Jaupart & Mareschal, 2005
$Q2=Q_{moho}$	**heat flow at the crust-mantle boundary**	**15.3**	**mW/m^2**	**this work**
	heat flow at the crust-mantle boundary	7-25	mW/m^2	Jaupart & Mareschal, 2005
Qm	**heat flow at 240 km for a 32mW/m² geotherm and 240 km lithospheric thickness**	**11.3**	**mW/m^2**	**this work**
	heat flow at 240 km for a 32mW/m² geotherm and 240 km lithospheric thickness	11	mW/m^2	Hasterok & Chapman, 2011
	heat flow at 240 km for a 32mW/m² geotherm and 240 km lithospheric thickness	70	mW/m^2	Rudnik et al., 1998

Table A7.1 List of the parameters used in the 3-layer model, including the values chosen in this work and those proposed by other authors.

A7.1.4. Criteria for the selection of the parameters involved in the modelling

- ***Lithospheric thickness (D)***

A three-layer model is preferred over a two-layer one (Hasterok and Chapman, 2011). In this model, we take D_1 = 23 km., D_2 = 17 km and $D_3 \geq 200$ km, for subcratonic lithosphere, following the general trend proposed by Hasterok and Chapman (2011). This gives a total crust thickness of 40 km, similar to the value proposed by Rudnick et al. (1998) (41 km). Total lithospheric thickness may have a seismic, thermal and petrological definition, giving rise to controversial results. Thermal thickness is defined as the intersection of the geotherm with a 1300 ºC adiabat. Using the geotherm defined previously by the garnet peridotites, this intersection occurs at approximately 240 km, thus defining the maximum thickness of the lithosphere in the Lundas Norte province.

According to Artemieva and Mooney (2002), Archaean lithosphere have two typical thicknesses 200-220 km and >300 Km. The range for African Archaean and early Proterozoic lithosphere thermal thickness 180-330 and 200-260 km respectively. Artemieva and Mooney (2002) also claimed that lithospheric thickness is highly variable due to basal drag and plate motion. Artemieva (2006) studied the correlations between age, thickness, heat flow and lithospheric growth. Some conclusions of this work include a pronounced peak in the rate of lithospheric growth can be deduced at 2.1-1.7 Ga. Artemieva found a good (r = 0.94) positive relation between thickness (adiabat 1300°C) and age of the cratons, which could be calculated using the following expression:

$$t(km) = 0.04*age(Ma) + 93.6$$

Therefore, a lithospheric thickness of 240 km would require an age of 3660 Ma, which is in good agreement with the oldest age of the Kasai-Angola craton (3400-3500 Ma) (e.g. Delhal and Ledent, 1973). Additionally, Artemieva (2006) found that the temperature gradient in the lithospheric mantle could be approximated by:

$$dT/dz = 537* (z_{1300})^{-0.88}$$

For a lithospheric thickness of 240 km, dT/dz would be 4.3 °C/km. Considering a 220km lithospheric thickness, the dT/dz = 4.7 °C/km.

Additionally Artemieva 2010 observed that Archaean terranes younger than 3.0 Ga usually follow a 38 mW/m^2 geotherm and that there is weak correlation between the depth of z_{HCL} (the depth where partial melt of the mantle starts, estimated by electric conductivity) and the surface heat flow Q_0:

$$z_{HCL}\,(km) = 418 * exp[-0.023 \cdot Q_0\,(mW/m^2)] \quad (3)$$

For Central and Southern Africa, the mantle adiabat is reached at 220 km depth.

None of these conclusions are in contradiction of the supposition of a maximum thickness of 240 km for the lithosphere under Catoca during Mesozoic times, obtained by intersection of the coldest geotherm (30 mW/m^2 with a 1300 °C adiabat). In any case, the extension of Artemieva's conclusions to the studied area is problematic since up to the authors' knowledge there is no data for the thickness of Angolan-Kassai craton.

- ***Heat generation (A)***

Following the model by Hasterok and Chapman 2011, the heat generation in the upper crust is given by the expression:

$$A_1 = [(1-F) \cdot Q_0]/D_1 \quad (4)$$

where F is a partition coefficient. In this work we have taken F=0.69 (In Hasterok and Chapman 2011, F=0.74). F and Q_0 are parameters to be fitted, to adjust geotherms to the positions of xenoliths.

Lower crust: $A_2 = 0.4 \cdot 10^{-6}$ W/m^3, as in Hasterok and Chapman 2011.

Lithospheric mantle: $A_3 = 0.02 \cdot 10^{-6}$ W/m^3 as in Hasterok and Chapman 2011; Rudnick et al. (1998) accepts values between $0.02\text{-}0.10 \cdot 10^{-6}$ W/m^3.

- ***Thermal conductivity (K)***

This parameter is dependent on temperature for lithospheric mantle. Based on average rock composition, the chosen values are 2.8 W/m°C, 2.7 W/m°C and 2.519 W/m°C for upper crust, lower crust and lithospheric mantle, respectively. To obtain these values, the equations proposed by Hofmeister (1999) were followed. These are temperature, pressure and composition- dependent

equations and were defined taking into account radioactive contribution of the different layers of the model.

According to Hogmeister (1999), the radioactive contribution to thermal conductivity as a function of temperature (in °C) can be calculated with the equation (5):

$$K_{rad}(T\,K) = 0.01753 - 0.00010365\cdot(T) + 2.2451\cdot10^{-7}\cdot(T)^2 - 3.407\cdot10^{-11}\cdot(T)^3 \quad (5)$$

Thermal conductivity is a function of some parameters [PP(Z), TM(Z)], which in turn depend on other parameters such as depth. As a result, the expression of conductivity as a function of temperature defined in equation 9 can only be defined if we consider other equations previously:

The pressure at depth Z in kb is:

$$PP_{(}z) = [D1\cdot g\cdot(\rho1-\rho3)+D2\cdot g\cdot(\rho2-\rho3)+z\cdot g\cdot\rho3]\cdot10^{-8} \quad (6)$$

Temperature as a function of P can be expressed using the equation 8:

$$TM_{(z)} = 1/0.0561 \cdot PP(Z)+8.376\cdot1/0.0561 \quad (7)$$

Therefore, combining equations 7 and 8, temperature as a function of Z in °C is:

$$TM_{(z)} = 1/0.0561 \cdot [[D1\cdot g\cdot(\rho1-\rho3)+D2\cdot g\cdot(\rho2-\rho3)+z\cdot g\cdot\rho3]\cdot10^{-8}]+8.376\cdot1/0.0561 \quad (8)$$

The conductivity in layer 3, as a function of T or Z, can be calculated with the following expression:

$$K3_{(z)}=K_{298}\cdot[298/(273.15+TM_{(z)})]^{a}\cdot\exp[-(4\cdot\gamma+1/3)\cdot\alpha\,(273.15+(TM_{(z)})-298)]\cdot(1+(dK_0\cdot P/K_0)+K_{rad}(TM_{(z)}) \quad (9)$$

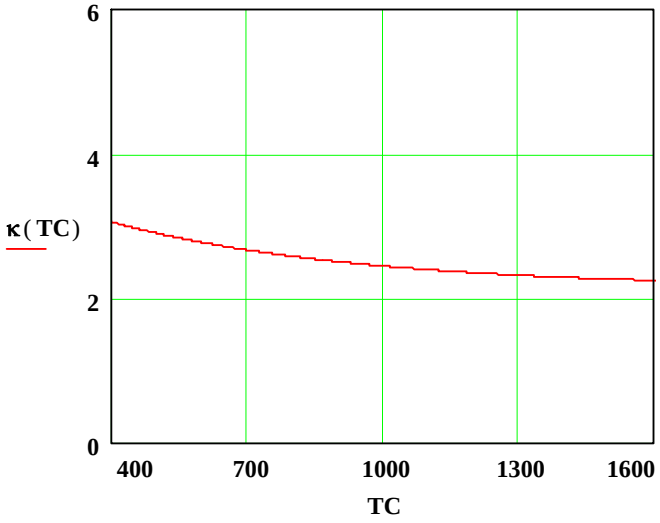


Fig. A7.3. Variation of thermal conductivity with temperature in the lithospheric mantle

- ***Heat flow (Q)***

The heat flow at the surface is an unknown value, since no measurements have been done in the Angolan-Kassai craton. Therefore, in this work Q_0 is a fitting parameter. After the modelling, the xenoliths studied are included in a family of geotherms ranging between 30-34 mW/m^2.

Our calculated heat flows for the other layers considering a 32mW/m^2 geotherm and 240km thickness are:

Q2 = 15.3 mW/m^2

Qm = 11.3 mW/m^2

These values are consistent with others obtained for other Archean and Proterozoic cratons (see table A7.1) (Rudnik et al., 1998; Jaupart and Mareschal, 2005; Artemieva, 2006; Hasterok and Chapman, 2011).

Values for the other parameters involved in the modelling (temperature, density, adiabatic gradient, fraction of head flow generated by crust) are included in table A7.1 and are compared with values used by other authors to calculate the geotherms in other regions. As shown in this table, the parameters used in the calculation are within the range of what can be found in the literature.

A7.1.5. Results of the modelling

Using the parameters described above, the modelling yielded cool geotherms (30-34 mW/m^2) for the SCLM beneath the Lunda Norte province. These values are found between the 35 and 40 mW/m^2 geotherms defined by Hasterok and Chapman (2011) using global models. As shown in fig. A7.4, the geotherm 32mW/m^2 is the one that is best correlated with the PT conditions of the studied xenoliths. The correlation between depth and temperature can also be found in fig. A7.5.

Finally, figure A7.6 summarises the parameters involved in the calculation of the geotherm 32mW/m^2 in the three-layer model described in this document.

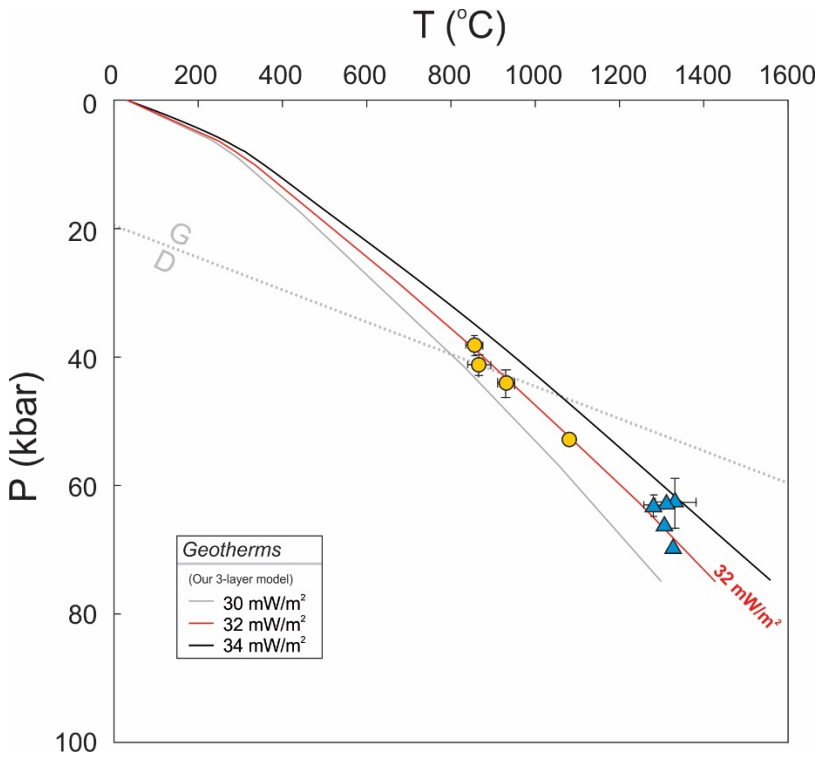


Figure A7.4. Family of three geotherms fitting the "best" pressure and temperature equilibration conditions for the peridotite xenoliths, in space P-T. Diamond-graphite boundary from

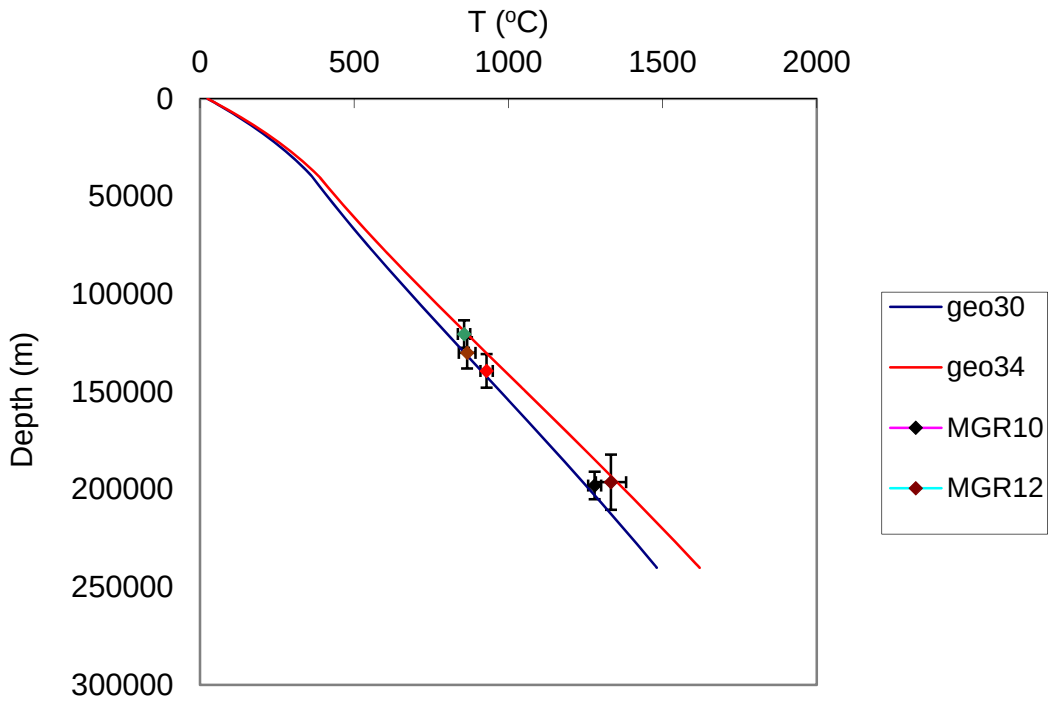


Figure A7.5. Family of three geotherms fitting the "best" pressure and temperature equilibration conditions for the peridotite xenoliths, in space P-T

Surface 0	Z0		Q0 = 0.032	T0 = 25
Layer 1	D1=23000	A1 = $4.3 \cdot 10^{-7}$	K1 = 2.8	ρ1 = 2700
Surface 1	Z1=D1		Q1 = 0.022	T1 = 247
Layer 2	D2 = 17000	A2 = $4 \cdot 10^{-7}$	K2 = 2.7	ρ2 = 2800
Surface 2	Z2=D1+D2		Q2 = 0.015	T2 = 365
Layer 3	D3 = 200000	A3 = $0.2 \cdot 10^{-7}$	K3, model	ρ3 = 3300
Surface m	Zm=D1+D2+D3		Qm = 0.0113	Tm = 1481

Figure A7.6: Parameters involved in the calculation of the three-layer model for a 32 mw·m^{-2} geotherm.

A7.2. Major-element composition of garnet xenocrysts. Rock type and metasomatism obtained from GEOSPEED software. Oxides in wt%. Structural formula normalised to 12 oxygens.

# Label	31b_16a	31b_16b	31b_17	31b_19bo	31b_20	31b_21	31b_23	31b_24	31b_24	31b_25o26	31b_25o26	31b_27	31b_28	31b_29	31b_29	31_30
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Rock Type (Ca, Cr)	Lherzolite	Lherzolite	Low-Cr garnets	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite
J.Gurney Ca, Cr (1984)	J1	J1	Low Cr	Low Cr	J1	Low Cr	J1	Low Cr	Low Cr	J1	J1	Low Cr	J1	Low Cr	Low Cr	J1
Dawson & Stephens (1975)	G11	G11	G2	G1	G1	G2	G1	G1	G1	G1	G1	G1	G2	G1	G1	G1
CARP (G3 - 2002)	L22	L23	L28	L13	L13	L13	L13	L28	L28	L28	L28	L28	L13	L13	L13	L13
Metasomatism class, using Ti, Zr, Sr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr
SiO_2	41.32	41.35	42.62	42.77	42.17	42.24	42.29	42.52	42.52	42.65	42.65	42.41	42.28	42.33	42.33	41.84
Al_2O_3	16.19	16.33	21.17	21.01	19.96	20.71	19.85	20.97	20.97	21.05	21.05	21.10	21.05	21.17	21.17	20.42
MgO	20.97	21.03	22.62	22.46	22.40	22.13	22.30	22.72	22.72	22.70	22.70	22.88	21.89	21.79	21.79	22.15
Cr_2O_3	8.14	8.04	1.48	1.76	2.95	1.98	3.30	1.85	1.85	2.08	2.08	1.70	2.00	1.94	1.94	3.54
MnO	0.29	0.34	0.26	0.24	0.26	0.26	0.27	0.27	0.27	0.28	0.28	0.27	0.34	0.30	0.30	0.32
CaO	5.97	5.95	4.49	4.40	4.75	4.48	4.92	4.61	4.61	4.59	4.59	4.34	4.31	4.22	4.22	4.80
Na_2O	0.09	0.09	0.10	0.11	0.09	0.11	0.10	0.09	0.09	0.08	0.08	0.10	0.13	0.12	0.12	0.07
TiO_2	0.99	1.04	1.00	0.84	0.91	0.93	0.98	0.89	0.89	0.78	0.78	0.88	0.81	0.82	0.82	0.48
FeO	6.75	6.99	7.91	7.76	7.80	8.34	7.21	7.13	7.13	7.06	7.06	7.48	8.41	8.32	8.32	7.30
NiO																
Total	100.71	101.16	101.65	101.35	101.29	101.18	101.22	101.05	101.05	101.27	101.27	101.16	101.22	101.01	101.01	100.92
Si	2.989	2.981	2.986	3.002	2.982	2.984	2.988	2.991	2.991	2.992	2.993	2.982	2.981	2.991	2.991	2.967
Al	1.380	1.387	1.748	1.738	1.664	1.725	1.653	1.739	1.738	1.741	1.741	1.749	1.749	1.763	1.763	1.707
Ti	0.048	0.051	0.048	0.041	0.044	0.046	0.049	0.041	0.042	0.038	0.037	0.041	0.047	0.039	0.039	0.023
Cr	0.466	0.458	0.082	0.098	0.165	0.111	0.184	0.103	0.103	0.115	0.115	0.095	0.112	0.108	0.108	0.198
Fe	0.408	0.421	0.463	0.456	0.461	0.493	0.426	0.419	0.419	0.414	0.414	0.440	0.496	0.492	0.492	0.433
Mn	0.018	0.021	0.015	0.014	0.016	0.016	0.016	0.016	0.016	0.017	0.017	0.016	0.020	0.018	0.018	0.019
Mg	2.261	2.260	2.362	2.350	2.361	2.331	2.349	2.382	2.382	2.374	2.374	2.398	2.301	2.295	2.295	2.341
Ca	0.463	0.460	0.337	0.331	0.360	0.339	0.372	0.347	0.347	0.345	0.345	0.327	0.326	0.319	0.319	0.365
Na	0.013	0.013	0.014	0.015	0.012	0.015	0.014	0.012	0.012	0.011	0.011	0.014	0.018	0.016	0.016	0.010
Ni	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.001
Total Oxides	100.608	101.075	101.582	101.310	101.218	101.132	101.167	100.953	100.970	101.222	101.206	101.066	101.305	100.935	100.928	100.873
Total Cations	8.046	8.052	8.057	8.046	8.066	8.059	8.052	8.053	8.052	8.047	8.048	8.062	8.050	8.042	8.043	8.063
Xmg	0.722	0.719	0.747	0.749	0.742	0.737	0.746	0.756	0.756	0.758	0.758	0.758	0.737	0.739	0.739	0.746
Xca	0.148	0.146	0.107	0.106	0.113	0.107	0.118	0.110	0.110	0.110	0.110	0.103	0.104	0.103	0.103	0.116
Xfe	0.130	0.134	0.147	0.145	0.145	0.156	0.135	0.133	0.133	0.132	0.132	0.139	0.159	0.158	0.158	0.138
Xal	0.748	0.752	0.955	0.947	0.910	0.940	0.900	0.944	0.944	0.938	0.938	0.949	0.940	0.942	0.942	0.896
Xcr	0.252	0.248	0.045	0.053	0.090	0.060	0.100	0.056	0.056	0.062	0.062	0.051	0.060	0.058	0.058	0.104
T(Ni, Griffin)	1307	1318	1366	1373	1347	1296	1331	1332	1337	1315	1329	1346	1328	1111	1118	1176
T(Ni, Griffin)	1394	1406	1459	1468	1439	1381	1421	1423	1427	1403	1419	1437	1417	1178	1185	1249
P local geotherm (kbar)	70	71	73	74	72	69	71	71	72	70	71	72	71	58	58	62
P(Cr) kB not reliable	49.2	49.1	25.4	28.0	35.1	29.2	36.4	28.3	28.3	29.8	29.9	27.7	29.5	28.1	28.1	36.3

A7.2. Major-element composition of garnet xenocrysts. Rock type and metasomatism obtained from GEOSPEED software. Oxides in wt%. Structural formula normalised to 12 oxygens.

# Label	31_31	31_31b	31_32	31_33	31_34	31_35	31_36	31_37	31_38	31_39a	31_39b	31_40	31_41L	31_42p	13b_43	13b_44
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Rock Type (Ca, Cr)	Lherzolite	Low-Cr garnets	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Ca harzburgite	Lherzolite	Lherzolite	Ca harzburgite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Ca harzburgite
J.Gurney Ca, Cr (1984)	J1	Low Cr	J1	Low Cr	J1	J1	J1	J3	J1	J1	J3	J1	J1	J1	J1	J5
Dawson & Stephens (1975)	G1	G2	G1	G2	G1	G1	G9	G9	G9	G1	G9	G1	G1	G11	G1	G9
CARP (G3 - 2002)	L13	L1	L28	L13	L13	L28	L15	L18	L7	L13	L5	L13	L28	L13	L13	H2
Metasomatism class, using Ti, Zr, Sr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Zr, low Ti, Sr	High Zr, low Ti, Sr	Depleted, low Sr	High Ti, Zr	Depleted, low Sr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	Depleted, low Sr
SiO_2	42.28	42.79	42.62	42.28	42.60	42.30	42.26	41.60	42.50	42.07	41.92	42.21	42.33	41.95	41.89	41.29
Al_2O_3	20.46	21.80	20.48	20.51	20.29	20.59	19.15	18.42	19.44	19.83	18.77	20.06	20.69	18.63	19.82	17.01
MgO	22.16	21.98	22.88	22.19	22.44	22.64	21.72	21.25	22.28	21.84	22.12	22.12	22.65	22.09	21.71	22.35
Cr_2O_3	2.55	0.50	2.38	1.97	3.36	2.30	5.03	6.66	4.82	3.19	6.62	3.19	2.56	4.83	3.25	9.13
MnO	0.27	0.28	0.24	0.27	0.27	0.28	0.29	0.40	0.26	0.32	0.35	0.28	0.27	0.29	0.28	0.39
CaO	4.34	4.07	4.33	4.52	4.70	4.58	5.55	4.95	5.16	4.79	4.47	4.82	4.71	5.09	4.88	3.92
Na_2O	0.12	0.16	0.12	0.11	0.08	0.10	0.05	0.05	0.04	0.10	0.05	0.09	0.10	0.10	0.10	0.07
TiO_2	0.89	1.20	0.87	1.03	0.66	0.87	0.33	0.14	0.19	0.92	0.09	0.85	0.88	1.01	0.90	0.19
FeO	8.21	8.82	7.35	8.32	7.05	7.27	7.00	7.19	6.54	7.87	6.75	7.51	6.90	7.00	8.22	6.66
NiO																
Total	101.28	101.60	101.27	101.20	101.45	100.93	101.38	100.66	101.23	100.93	101.14	101.13	101.09	100.99	101.05	101.01
Si	2.987	2.999	2.997	2.988	2.995	2.985	2.995	2.985	3.003	2.989	2.981	2.987	2.980	2.987	2.980	2.963
Al	1.703	1.800	1.697	1.709	1.681	1.713	1.600	1.558	1.619	1.661	1.573	1.673	1.717	1.563	1.662	1.439
Ti	0.043	0.057	0.041	0.050	0.033	0.043	0.017	0.007	0.009	0.045	0.005	0.041	0.044	0.050	0.043	0.009
Cr	0.142	0.028	0.132	0.110	0.187	0.128	0.282	0.378	0.269	0.179	0.372	0.178	0.143	0.272	0.183	0.518
Fe	0.485	0.517	0.432	0.492	0.415	0.429	0.415	0.431	0.386	0.468	0.401	0.444	0.406	0.417	0.489	0.400
Mn	0.016	0.017	0.014	0.016	0.016	0.017	0.017	0.024	0.016	0.019	0.021	0.017	0.016	0.017	0.017	0.024
Mg	2.333	2.296	2.398	2.338	2.352	2.382	2.295	2.273	2.347	2.313	2.344	2.333	2.377	2.344	2.302	2.390
Ca	0.328	0.306	0.326	0.342	0.354	0.346	0.421	0.381	0.391	0.365	0.341	0.365	0.355	0.388	0.372	0.301
Na	0.016	0.022	0.016	0.015	0.011	0.014	0.007	0.007	0.005	0.014	0.007	0.012	0.014	0.014	0.014	0.010
Ni	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.000
Total Oxides	101.211	101.498	101.189	101.117	101.423	100.893	101.387	100.662	101.221	100.856	101.144	101.055	101.050	100.921	100.966	101.002
Total Cations	8.056	8.041	8.056	8.060	8.044	8.058	8.050	8.044	8.046	8.053	8.045	8.053	8.053	8.053	8.062	8.054
Xmg	0.741	0.736	0.760	0.737	0.754	0.754	0.733	0.737	0.751	0.735	0.760	0.742	0.757	0.744	0.728	0.773
Xca	0.104	0.098	0.103	0.108	0.113	0.110	0.135	0.123	0.125	0.116	0.110	0.116	0.113	0.123	0.118	0.097
Xfe	0.154	0.166	0.137	0.155	0.133	0.136	0.133	0.140	0.124	0.149	0.130	0.141	0.129	0.132	0.155	0.129
Xal	0.923	0.985	0.928	0.939	0.900	0.930	0.850	0.805	0.857	0.903	0.809	0.904	0.923	0.852	0.901	0.735
Xcr	0.077	0.015	0.072	0.061	0.100	0.070	0.150	0.195	0.143	0.097	0.191	0.096	0.077	0.148	0.099	0.265
T(Ni, Griffin)	1335	1333	1390	1378	1318	1325	1322	919	1306	1284	1019	1321	1344	1366	1268	995
T(Ni, Griffin)	1425	1424	1487	1473	1406	1414	1411	969	1393	1368	1077	1410	1435	1460	1351	1051
P local geotherm (kbar)	72	71	75	74	71	71	71	46	70	68	52	71	72	74	67	51
P(Cr) kB not reliable	33.4	12.8	33.0	29.5	36.9	31.6	41.4	41.5	41.7	35.7	43.7	35.8	32.8	42.7	35.6	49.1

A7.2. Major-element composition of garnet xenocrysts. Rock type and metasomatism obtained from GEOSPEED software. Oxides in wt%. Structural formula normalised to 12 oxygens.

# Label	13b_45	13b_46	13b_46	13b_47	13b_48bo	13b_49	13b_49d	13b_50	13b_51	13b_52	13b_56	13b_57	35_78	35_78	35_81	35_82
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Rock Type (Ca, Cr)	Lherzolite	Lherzolite	Lherzolite	Low-Cr garnets	Low-Cr garnets	Lherzolite	Lherzolite	Lherzolite	Low-Cr garnets	Low-Cr garnets	Ca harzburgite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Low-Cr garnets
J.Gurney Ca, Cr (1984)	J1	Low Cr	Low Cr	Low Cr	Low Cr	J1	J1	Low Cr	Low Cr	Low Cr	J2	J1	J1	J1	J1	Low Cr
Dawson & Stephens (1975)	G1	G1	G1	G1	G3	G9	G9	G1	G1	G1	G9	G11	G1	G1	G1	G8
CARP (G3 - 2002)	L13	L13	L13	L28	L2	L10b	L10b	L28	L28	L13	L10b	L24	L13	L13	L13	L1
Metasomatism class, using Ti, Zr, Sr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Zr, Sr, low Ti	Depleted, low Sr	Depleted, low Sr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Zr, low Ti, Sr	High Ti, low Zr	High Ti, Zr	High Zr, low Ti, Sr	Insufficient parameters	High Ti, Zr
SiO_2	42.25	42.17	42.17	42.25	39.20	41.46	41.75	42.43	42.64	42.68	42.50	40.94	41.56	41.56	42.05	52.01
Al_2O_3	20.35	21.14	21.14	20.74	21.71	19.57	19.66	21.08	21.44	21.40	21.56	17.01	20.18	20.18	19.82	3.90
MgO	22.51	21.79	21.79	22.69	8.18	21.19	21.16	22.88	22.87	21.89	22.35	20.59	21.10	21.10	21.73	12.40
Cr_2O_3	2.69	1.72	1.72	1.46	0.00	5.45	5.14	1.62	1.08	1.20	2.79	6.47	3.72	3.72	3.29	0.00
MnO	0.25	0.27	0.27	0.23	0.52	0.43	0.39	0.26	0.29	0.25	0.35	0.38	0.46	0.46	0.29	0.03
CaO	4.65	4.69	4.69	4.24	8.83	5.03	5.00	4.08	4.14	4.99	4.02	5.54	5.31	5.31	4.75	20.16
Na_2O	0.08	0.08	0.08	0.11	0.02	0.06	0.06	0.11	0.11	0.05	0.06	0.14	0.10	0.10	0.12	2.40
TiO_2	0.57	0.68	0.68	0.93	0.04	0.23	0.22	0.77	0.85	0.42	0.13	1.24	0.41	0.41	0.89	0.31
FeO	7.79	8.50	8.50	8.09	21.60	7.55	7.53	7.70	7.63	8.23	7.43	8.38	8.19	8.19	7.87	8.44
NiO																
Total	101.14	101.04		100.74	100.10	100.97	100.91	100.93	101.05	101.11	101.19	100.69	101.03	101.03	100.81	99.65
Si	2.986	2.984	2.980	2.990	2.986	2.962	2.978	2.989	2.995	3.005	2.986	2.970	2.954	2.964	2.990	3.859
Al	1.695	1.763	1.761	1.730	1.949	1.648	1.653	1.750	1.775	1.776	1.785	1.454	1.690	1.696	1.661	0.341
Ti	0.028	0.033	0.040	0.044	0.021	0.010	0.011	0.037	0.040	0.024	0.007	0.061	0.041	0.020	0.045	0.049
Cr	0.150	0.096	0.096	0.082	0.000	0.308	0.290	0.090	0.060	0.067	0.155	0.371	0.209	0.210	0.185	0.000
Fe	0.460	0.503	0.502	0.479	1.376	0.451	0.449	0.454	0.448	0.485	0.437	0.508	0.487	0.489	0.468	0.524
Mn	0.015	0.016	0.016	0.014	0.034	0.026	0.024	0.016	0.017	0.015	0.021	0.023	0.028	0.028	0.017	0.002
Mg	2.371	2.298	2.295	2.393	0.929	2.256	2.249	2.402	2.394	2.297	2.340	2.227	2.235	2.243	2.303	1.371
Ca	0.352	0.356	0.355	0.321	0.721	0.385	0.382	0.308	0.312	0.376	0.303	0.431	0.404	0.406	0.362	1.603
Na	0.011	0.011	0.011	0.015	0.003	0.008	0.008	0.015	0.015	0.007	0.008	0.020	0.014	0.014	0.017	0.345
Ni	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.001	0.001	0.000	0.001	0.001	0.000	0.001	0.001
Total Oxides	101.107	100.987	101.131	100.658	100.435	100.936	100.902	100.877	100.972	101.165	101.193	100.576	101.396	100.998	100.776	100.233
Total Cations	8.069	8.060	8.057	8.068	8.020	8.054	8.044	8.061	8.056	8.053	8.041	8.066	8.063	8.070	8.050	8.095
Xmg	0.745	0.728	0.728	0.749	0.307	0.730	0.730	0.759	0.759	0.727	0.760	0.703	0.715	0.715	0.735	0.392
Xca	0.111	0.113	0.113	0.101	0.238	0.124	0.124	0.097	0.099	0.119	0.098	0.136	0.129	0.129	0.116	0.458
Xfe	0.145	0.159	0.159	0.150	0.455	0.146	0.146	0.143	0.142	0.153	0.142	0.161	0.156	0.156	0.149	0.150
Xal	0.919	0.948	0.948	0.955	1.000	0.843	0.851	0.951	0.967	0.964	0.920	0.797	0.890	0.890	0.900	1.000
Xcr	0.081	0.052	0.052	0.045	0.000	0.157	0.149	0.049	0.033	0.036	0.080	0.203	0.110	0.110	0.100	0.000
T(Ni, Griffin)	1362	1258	1358	1459	1330	892	879	1426	1369	1514	963	1227	1330	997	1294	1553
T(Ni, Griffin)	1455	1339	1451	1565	1420	939	924	1527	1463	1626	1015	1306	1420	1054	1379	1670
P local geotherm (kbar)	73	67	73	79	71	44	43	77	74	83	49	65	71	51	69	85
P(Cr) kB not reliable	33.8	26.3	26.7	26.3	Low Cr	38.2	37.3	27.8	22.1	21.8	32.3	45.1	36.4	33.7	36.3	Low Cr

A7.2. Major-element composition of garnet xenocrysts. Rock type and metasomatism obtained from GEOSPEED software. Oxides in wt%. Structural formula normalised to 12 oxygens.

# Label	13c_01	13c_02	13c_03	13c_04	13c_04b	13c_05	13c_06	13c_07	13c_08	13c_09	13c_11	13c_12	13c_13	13c_14	13c_15	32a_87
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Rock Type (Ca, Cr)	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Low-Cr garnets	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite
J.Gurney Ca, Cr (1984)	Low Cr	J1	J1	J1	Low Cr	J1	J1	Low Cr	J1	Low Cr	J1	Low Cr	J1	J1	J1	J1
Dawson & Stephens (1975)	G2	G9	G1	G9	G1	G1	G1	G1	G1	G1	G9	G1	G11	G1	G9	G1
CARP (G3 - 2002)	L13	L13	L28	L7	L13	L28	L13	L28	L13	L28	L23	L28	L13	L13	L7	L13
Metasomatism class, using Ti, Zr, Sr	High Ti, Zr	Depleted, low Sr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	Depleted, low Sr	High Ti, Zr
SiO_2	42.87	42.22	42.45	40.49	42.42	42.52	42.06	43.09	42.31	42.66	41.50	43.01	42.44	42.47	41.41	42.42
Al_2O_3	21.15	20.42	20.93	16.80	21.51	20.07	20.01	21.32	19.33	21.22	18.02	20.92	18.68	20.48	18.28	20.37
MgO	22.48	21.86	22.79	20.82	22.29	22.69	21.89	23.06	22.43	22.71	21.14	22.79	22.12	22.53	20.58	22.45
Cr_2O_3	1.81	3.96	2.27	6.44	1.14	2.60	3.28	1.57	3.98	1.64	6.88	1.89	4.14	2.60	7.10	2.61
MnO	0.25	0.37	0.27	0.31	0.31	0.26	0.32	0.25	0.30	0.25	0.38	0.25	0.25	0.27	0.39	0.28
CaO	4.44	5.06	4.41	6.21	4.12	4.43	4.71	4.18	4.72	4.33	5.72	4.22	4.76	4.78	6.06	4.56
Na_2O	0.10	0.03	0.11	0.07	0.11	0.11	0.11	0.11	0.12	0.10	0.05	0.10	0.12	0.08	0.02	0.09
TiO_2	0.95	0.20	0.81	0.96	0.84	0.91	0.92	0.81	0.99	0.82	0.39	0.79	1.12	0.79	0.15	0.75
FeO	8.10	7.62	7.55	7.00	8.59	7.70	8.24	7.64	7.46	7.78	7.44	7.87	8.13	7.46	7.01	7.54
NiO																
Total	102.15	101.74	101.59	100.24	101.33	101.29	101.54	102.03	101.64	101.51	101.52	101.84	101.76	101.46	101.00	101.07
Si	2.992	2.976	2.978	2.968	2.985	2.998	2.976	3.000	2.987	2.990	2.968	3.006	3.004	2.989	2.973	2.994
Al	1.740	1.697	1.730	1.451	1.784	1.668	1.669	1.749	1.608	1.753	1.519	1.723	1.558	1.699	1.547	1.695
Ti	0.046	0.009	0.039	0.029	0.039	0.044	0.045	0.037	0.048	0.038	0.019	0.038	0.054	0.036	0.007	0.038
Cr	0.100	0.221	0.126	0.373	0.063	0.145	0.183	0.086	0.222	0.091	0.389	0.104	0.232	0.145	0.403	0.146
Fe	0.473	0.449	0.443	0.429	0.506	0.454	0.488	0.445	0.440	0.456	0.445	0.460	0.481	0.439	0.421	0.445
Mn	0.015	0.022	0.016	0.019	0.018	0.016	0.019	0.015	0.018	0.015	0.023	0.015	0.015	0.016	0.024	0.017
Mg	2.338	2.297	2.383	2.275	2.338	2.385	2.308	2.393	2.360	2.373	2.253	2.374	2.333	2.363	2.202	2.362
Ca	0.332	0.382	0.331	0.488	0.311	0.335	0.357	0.312	0.357	0.325	0.438	0.316	0.361	0.360	0.466	0.345
Na	0.014	0.004	0.015	0.010	0.015	0.015	0.015	0.015	0.016	0.014	0.007	0.014	0.016	0.011	0.003	0.012
Ni	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.000	0.001
Total Oxides	102.093	101.725	101.539	99.815	101.238	101.226	101.477	101.950	101.569	101.434	101.499	101.783	101.673	101.368	100.992	101.043
Total Cations	8.049	8.058	8.062	8.149	8.060	8.059	8.061	8.053	8.058	8.056	8.062	8.050	8.056	8.059	8.046	8.054
Xmg	0.744	0.734	0.755	0.713	0.741	0.751	0.732	0.760	0.747	0.752	0.718	0.754	0.735	0.747	0.713	0.749
Xca	0.106	0.122	0.105	0.153	0.098	0.105	0.113	0.099	0.113	0.103	0.140	0.100	0.114	0.114	0.151	0.109
Xfe	0.150	0.144	0.140	0.134	0.160	0.143	0.155	0.141	0.139	0.145	0.142	0.146	0.152	0.139	0.136	0.141
Xal	0.946	0.885	0.932	0.795	0.966	0.920	0.901	0.953	0.879	0.951	0.796	0.943	0.871	0.922	0.793	0.921
Xcr	0.054	0.115	0.068	0.205	0.034	0.080	0.099	0.047	0.121	0.049	0.204	0.057	0.129	0.078	0.207	0.079
T(Ni, Griffin)	1381	1077	1304	1290	1212	1437	1274	1444	1378	1360	1089	1400	1459	1303	968	1155
T(Ni, Griffin)	1477	1141	1391	1375	1288	1540	1358	1547	1473	1453	1154	1497	1564	1390	1021	1226
P local geotherm (kbar)	74	56	70	69	64	78	68	78	74	73	56	76	79	70	49	60
P(Cr) kB not reliable	28.2	36.2	31.5	44.6	21.9	34.3	36.1	27.1	40.3	27.1	43.7	29.6	41.5	32.8	41.3	32.6

A7.2. Major-element composition of garnet xenocrysts. Rock type and metasomatism obtained from GEOSPEED software. Oxides in wt%. Structural formula normalised to 12 oxygens.

# Label	32a_87	32a_88	32a_89	32a_90	32a_90b	32a_92	32a_93	32a_94	32a_95	32a_95b	32a_96	32a_97	32a_98	31_b_076	15A-f-87	26_a_003
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Rock Type (Ca, Cr)	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite
J.Gurney Ca, Cr (1984)	J1	J1	Low Cr	J1	J1	J1	Low Cr	J1	J1	J1	J1	Low Cr	J1	J1	J1	J1
Dawson & Stephens (1975)	G1	G1	G1	G11	G1	G1	G1	G1	G9	G9	G1	G1	G9	G1	G1	G9
CARP (G3 - 2002)	L13	L13	L13	L23	L13	L13	L13	L13	L10b	L10b	L28	L28	L10b	L13	L13	L11
Metasomatism class, using Ti, Zr, Sr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	Depleted, low Sr	Depleted, low Sr	High Ti, Zr	High Ti, Zr	Depleted, low Sr	High Ti, Zr	High Ti, Zr	High Ti, Zr
SiO_2	42.42	42.26	42.33	41.32	41.76	42.30	42.38	42.24	41.88	41.42	42.25	42.34	42.16	41.69	41.69	40.34
Al_2O_3	20.37	20.79	20.95	17.12	20.61	20.60	21.21	20.24	20.42	20.27	20.91	21.20	19.46	19.96	21.15	18.98
MgO	22.45	22.28	22.33	20.49	22.03	22.07	22.42	22.30	20.46	20.63	22.78	22.81	22.43	21.14	22.48	20.73
Cr_2O_3	2.61	2.12	1.79	6.54	2.04	3.13	1.57	2.61	4.26	4.24	2.38	1.55	4.92	3.13	2.07	5.52
MnO	0.28	0.25	0.28	0.30	0.26	0.26	0.28	0.28	0.48	0.50	0.27	0.28	0.25	0.36	0.27	0.48
CaO	4.56	4.65	4.35	5.95	4.36	4.41	4.47	4.70	4.84	4.94	4.64	4.26	5.31	4.78	4.51	5.46
Na_2O	0.09	0.09	0.09	0.07	0.11	0.09	0.07	0.11	0.06	0.06	0.08	0.10	0.02	0.08	0.08	0.06
TiO_2	0.75	0.84	0.77	0.85	0.85	0.41	0.77	1.05	0.25	0.25	0.72	0.79	0.13	0.83	0.81	0.54
FeO	7.54	7.33	7.90	8.20	8.29	7.86	7.64	7.45	8.24	8.43	7.02	7.61	5.94	7.39	7.2	7.99
NiO														0.07	0.01	0.02
Total	101.07	100.61	100.79	100.84	100.31	101.13	100.81	100.98	100.89	100.74	101.05	100.94	100.62	99.42	100.3	100.13
Si	2.995	2.990	2.992	2.987	2.977	2.990	2.990	2.988	2.986	2.965	2.976	2.982	2.992	3.002	2.959	2.928
Al	1.695	1.734	1.745	1.459	1.731	1.716	1.763	1.687	1.716	1.710	1.736	1.760	1.628	1.694	1.769	1.624
Ti	0.037	0.042	0.038	0.044	0.043	0.019	0.038	0.050	0.012	0.012	0.035	0.039	0.006	0.038	0.042	0.024
Cr	0.146	0.119	0.100	0.374	0.115	0.175	0.088	0.146	0.240	0.240	0.133	0.086	0.276	0.178	0.116	0.317
Fe	0.445	0.434	0.467	0.496	0.494	0.465	0.451	0.441	0.491	0.505	0.413	0.448	0.353	0.445	0.427	0.485
Mn	0.017	0.015	0.017	0.018	0.016	0.016	0.017	0.017	0.029	0.030	0.016	0.017	0.015	0.022	0.016	0.030
Mg	2.362	2.350	2.353	2.208	2.341	2.325	2.357	2.351	2.175	2.201	2.391	2.395	2.373	2.269	2.378	2.243
Ca	0.345	0.353	0.329	0.461	0.333	0.334	0.338	0.356	0.370	0.379	0.350	0.321	0.404	0.369	0.343	0.425
Na	0.012	0.012	0.012	0.010	0.015	0.012	0.010	0.015	0.008	0.008	0.011	0.014	0.003	0.011	0.011	0.008
Ni	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.000
Total Oxides	101.030	100.565	100.743	100.812	100.267	101.081	100.772	100.890	100.861	100.716	100.999	100.894	100.624	99.250	100.255	100.003
Total Cations	8.054	8.048	8.054	8.057	8.065	8.052	8.052	8.053	8.028	8.052	8.061	8.063	8.051	8.029	8.063	8.082
Xmg	0.749	0.749	0.747	0.698	0.739	0.744	0.749	0.747	0.716	0.714	0.758	0.757	0.758	0.736	0.755	0.711
Xca	0.109	0.112	0.105	0.146	0.105	0.107	0.107	0.113	0.122	0.123	0.111	0.102	0.129	0.120	0.109	0.135
Xfe	0.141	0.138	0.148	0.157	0.156	0.149	0.143	0.140	0.162	0.164	0.131	0.142	0.113	0.144	0.136	0.154
Xal	0.921	0.936	0.946	0.796	0.938	0.908	0.953	0.920	0.877	0.877	0.929	0.953	0.855	0.905	0.938	0.837
Xcr	0.079	0.064	0.054	0.204	0.062	0.092	0.047	0.080	0.123	0.123	0.071	0.047	0.145	0.095	0.062	0.163
T(Ni, Griffin)	1324	1343	1336	1279	1307	1259	1335	1329	770	769	1326	1307	1321	1347	1365	998
T(Ni, Griffin)	1413	1434	1427	1363	1394	1341	1425	1419	807	806	1415	1394	1410	1439	1459	1054
P local geotherm (kbar)	71	72	72	68	70	67	72	71	37	37	71	70	71	72	73	51
P(Cr) kB not reliable	33.4	30.1	28.2	44.7	29.9	35.7	26.1	33.2	32.8	32.6	31.8	26.4	41.8	35.3	29.9	39.1

A7.2. Major-element composition of garnet xenocrysts. Rock type and metasomatism obtained from GEOSPEED software. Oxides in wt%. Structural formula normalised to 12 oxygens.

# Label	26_d_009	26_e_012	26_g_019	26_j_034	32A_c_080	32A_e_085	34_c_014	35_g_052	42_e_163	6A(2)_x_089	6A(2)_y_098	6A(2)_y2_102	6A_b_038	6A_f_063	6A_g_065
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Rock Type (Ca, Cr)	Lherzolite	Lherzolite	Wehrlite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Low-Cr garnets
J.Gurney Ca, Cr (1984)	Low Cr	J1	Wehrlitic	J1	Low Cr	J1	J1	J1	J1	Low Cr	Low Cr	Low Cr	J1	J1	Low Cr
Dawson & Stephens (1975)	G1	G1	G11	G1	G1	G1	G11	G1	G1	G1	G1	G9	G1	G11	G1
CARP (G3 - 2002)	L13	L13	L24	L13	L13	L13	L21	L13	L13	L13	L13	L7	L13	L23	H3
Metasomatism class, using Ti, Zr, Sr	High Ti, low Zr	High Ti, low Zr	High Zr, low Ti, Sr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Ti, Zr	High Zr, Sr, low Ti	High Ti, low Zr	High Ti, Zr	High Ti, Zr
SiO_2	41.73	41.11	38.38	40.88	41.92	41.23	41.17	42.38	41.79	41.82	42.34	41.08	41.59	41.05	41.04
Al_2O_3	21.32	19.11	14.36	20.64	21.11	20.9	17.41	20.87	19.96	20.53	20.77	20.73	20.88	17.44	21.39
MgO	21.99	21.59	15.13	22.1	21.48	21.33	19.75	22.47	20.8	21.46	22	20.84	22.3	20.56	21.21
Cr_2O_3	1.51	4.03	10.75	2.41	1.78	2.04	6.04	2.4	2.92	1.77	1.71	1.78	2	6.11	1.37
MnO	0.37	0.38	0.52	0.29	0.28	0.28	0.23	0.28	0.35	0.26	0.27	0.35	0.27	0.3	0.37
CaO	4.27	4.9	9.36	4.72	4.36	4.34	5.63	4.58	4.7	4.57	4.2	4.28	4.26	5.49	3.94
Na_2O	0.07	0.11	0.09	0.12	0.08	0.1	0.08	0.11	0.1	0.08	0.12	0.13	0.09	0.12	0.13
TiO_2	0.89	1.16	0.6	0.92	0.71	0.8	0.85	0.84	0.85	0.98	0.83	0.86	0.78	1.17	0.79
FeO	7.8	7.78	9.53	7.43	8.14	8.41	7.99	7.5	8.03	8.69	7.81	9.52	7.77	7.57	9.58
NiO	0.03	0.01	0.05	0.08	0.08	0.08	0.01	0.09	0.05	0.03	0.05	0.04	0.01	0.02	0.02
Total	99.98	100.17	98.77	99.59	99.95	99.52	99.16	101.52	99.55	100.19	100.09	99.61	99.94	99.84	99.86
Si	2.972	2.959	2.938	2.936	2.990	2.964	3.014	2.980	3.006	3.001	3.011	2.980	2.967	2.985	2.951
Al	1.790	1.621	1.295	1.747	1.775	1.771	1.502	1.730	1.692	1.737	1.741	1.772	1.756	1.495	1.813
Ti	0.045	0.056	0.031	0.050	0.041	0.045	0.045	0.039	0.047	0.025	0.040	0.018	0.039	0.058	0.039
Cr	0.085	0.229	0.651	0.137	0.100	0.116	0.350	0.133	0.166	0.100	0.096	0.102	0.113	0.351	0.078
Fe	0.465	0.468	0.610	0.446	0.486	0.506	0.489	0.441	0.483	0.522	0.464	0.577	0.464	0.460	0.576
Mn	0.022	0.023	0.034	0.018	0.017	0.017	0.014	0.017	0.021	0.016	0.016	0.022	0.016	0.018	0.023
Mg	2.334	2.316	1.726	2.366	2.284	2.286	2.155	2.355	2.230	2.296	2.332	2.253	2.372	2.229	2.273
Ca	0.326	0.378	0.768	0.363	0.333	0.334	0.442	0.345	0.362	0.351	0.320	0.333	0.326	0.428	0.304
Na	0.010	0.015	0.013	0.017	0.011	0.014	0.011	0.015	0.014	0.011	0.017	0.018	0.012	0.017	0.018
Ni	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001
Total Oxides	99.933	100.062	98.661	99.547	99.921	99.480	99.127	101.348	99.536	99.665	99.994	99.041	99.907	99.715	99.767
Total Cations	8.051	8.067	8.065	8.081	8.037	8.055	8.022	8.056	8.024	8.060	8.038	8.075	8.066	8.042	8.075
Xmg	0.747	0.732	0.556	0.745	0.736	0.731	0.698	0.750	0.725	0.724	0.748	0.712	0.750	0.715	0.721
Xca	0.104	0.119	0.247	0.114	0.107	0.107	0.143	0.110	0.118	0.111	0.103	0.105	0.103	0.137	0.096
Xfe	0.149	0.148	0.197	0.141	0.157	0.162	0.159	0.140	0.157	0.165	0.149	0.183	0.147	0.148	0.183
Xal	0.955	0.876	0.666	0.927	0.946	0.939	0.811	0.928	0.911	0.945	0.948	0.946	0.940	0.810	0.959
Xcr	0.045	0.124	0.334	0.073	0.054	0.061	0.189	0.072	0.089	0.055	0.052	0.054	0.060	0.190	0.041
T(Ni, Griffin)	1357	1353	929	1374	1347	1310	1267	1358	1286	1325	1446	528	1450	1365	1258
T(Ni, Griffin)	1450	1446	979	1469	1439	1398	1350	1451	1370	1414	1550	550	1554	1459	1339
P local geotherm (kbar)	73	73	47	74	72	70	67	73	69	71	79	23	79	73	67
P(Cr) kB not reliable	25.8	39.7	39.6	31.8	27.7	29.5	43.5	32.0	34.0	27.5	28.1	21.3	30.3	45.3	24.4

A7.2. Trace-element composition of garnet xenocrysts. Rock type and metasomatism obtained from GEOSPEED software. Data in ppm. Values below detection limit are represented by "bdl", whereas the not analysed elements, by "NA"

# Label	31b_16a	31b_16b	31b_17	31b_19bo	31b_20	31b_21	31b_23	31b_24	31b_24
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Rock Type (Ca, Cr)	Lherzolite	Lherzolite	Low-Cr garnets	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite
Li	bdl	0.289	bdl	bdl	0.39	bdl	0.31	0.30	bdl
Be	0.150	0.102	bdl	bdl	bdl	bdl	0.036	bdl	bdl
B	2.63	2.65	2.31	1.83	1.75	1.43	1.74	1.34	2.25
Na	547	590	665	655	592	732	621	570	575
Mg	118700	118600	128700	128700	125600	126900	127000	126000	128400
Al	82600	83100	108200	107100	102300	106500	101900	105600	106300
Si	193100	193300	199200	199900	197100	197400	197700	198800	198800
P	179	163	156	165	157	158	170	150	148
K	1.86	1.97	bdl	bdl	1.84	3.25	3.34	bdl	2.25
Ca	39100	38500	28570	27870	30480	28780	31400	28100	29140
Sc	147.3	145.4	78.2	70.3	81.5	76.0	84.3	75.7	78.7
Ti	5250	5650	5500	4710	4940	5210	5470	4670	4780
V	369	373	248.7	235.4	251.0	248.9	265.6	252.3	253.6
Cr	51200	49100	8470	10460	17890	11670	19760	10190	12120
Mn	2276	2280	1977	1918	2006	2097	2068	1984	2045
Fe	39800	40000	44900	45600	44000	48100	42500	41700	42400
Co	41.5	41.8	45.9	46.7	44.4	46.8	43.5	44.8	44.5
Ni	101.4	103.8	114.3	116.0	110.2	99.0	106.6	107.0	107.9
Cu	0.839	0.847	0.655	0.596	0.494	0.578	0.590	0.685	0.570
Zn	12.31	12.14	18.68	18.90	17.85	18.57	15.95	13.95	14.66
Ga	6.29	6.62	12.52	13.28	11.81	14.23	12.03	12.21	11.65
Rb	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Sr	0.734	0.753	0.601	0.444	0.652	0.441	0.524	0.351	0.424
Y	11.36	15.63	21.12	19.07	18.84	21.26	19.98	17.80	17.28
Zr	95.3	102.7	68.9	60.0	69.2	66.5	82.5	71.8	73.0
Nb	0.410	0.382	0.178	0.256	0.225	0.223	0.290	0.201	0.212
Cs	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Ba	bdl	bdl	0.0257	bdl	bdl	0.0428	0.0327	bdl	bdl
La	0.0592	0.0630	0.0334	0.0268	0.0346	0.0359	0.0297	0.0251	0.0232
Ce	0.589	0.516	0.311	0.340	0.342	0.301	0.374	0.228	0.255
Pr	0.219	0.218	0.130	0.0850	0.153	0.113	0.1164	0.1096	0.1144
Nd	2.19	2.16	1.021	1.196	1.287	0.863	1.408	0.930	1.059
Sm	1.867	1.840	0.921	0.786	1.060	0.720	1.162	0.858	0.874
Eu	0.916	0.872	0.586	0.405	0.537	0.392	0.552	0.415	0.423
Gd	2.83	3.19	1.87	1.63	2.15	1.51	2.31	1.88	1.92
Tb	0.471	0.590	0.405	0.409	0.432	0.452	0.434	0.366	0.392
Dy	2.70	3.42	3.49	2.87	3.25	3.30	3.41	2.80	3.02
Ho	0.435	0.581	0.815	0.768	0.704	0.736	0.798	0.634	0.723
Er	0.987	1.441	2.52	2.271	2.19	2.49	2.275	2.062	2.093
Tm	0.1258	0.187	0.389	0.330	0.382	0.359	0.314	0.302	0.307
Yb	0.840	1.120	2.55	2.34	2.12	2.58	2.21	2.17	2.023
Lu	0.1336	0.160	0.407	0.358	0.369	0.405	0.296	0.346	0.317
Hf	2.092	2.52	1.774	1.571	1.821	1.662	2.152	1.708	1.712
Ta	0.0428	0.0341	0.0140	0.0101	0.0201	0.0276	0.0133	0.0280	0.0227
Pb	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Th	0.0163	0.0166	bdl	bdl	bdl	bdl	0.0104	bdl	bdl
U	0.0167	0.0213	bdl	0.0085	0.0098	0.0118	0.0199	bdl	0.0107

A7.2. Trace-element composition of garnet xenocrysts. Rock type and metasomatism obtained from GEOSPEED software. Data in ppm. Values below detection limit are represented by "bdl", whereas the not analysed elements, by "NA"

# Label	31b_25o26	31b_25o26	31b_27	31b_28	31b_29	31b_29	31_30	31_31	31_31b
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Rock Type (Ca, Cr)	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Low-Cr garnets
Li	0.35	bdl	0.29	0.516	0.31	0.54	bdl	0.468	0.46
Be	bdl	bdl	0.045	bdl	bdl	bdl	bdl	bdl	bdl
B	1.60	2.07	2.30	1.86	1.58	2.00	bdl	2.33	1.75
Na	473	532	651	687	750	757	469	758	956
Mg	125900	128800	127100	124300	123600	122200	123700	125900	126300
Al	105900	107000	105500	94100	107000	105800	103000	103700	110200
Si	199400	199400	198200	197600	197900	197900	195600	197600	200000
P	159	148	160	160	123.3	115.8	bdl	134	191
K	bdl	bdl	bdl	bdl	2.54	4.57	5.79	bdl	bdl
Ca	29330	29050	27070	32300	27170	26770	29350	27640	26110
Sc	80.4	74.3	72.2	113.7	86.6	86.7	90.0	72.2	60.3
Ti	4310	4210	4630	5290	4420	4380	2540	4840	6500
V	258.9	233.1	222.9	278.7	231.6	230.4	242.8	217.2	253.6
Cr	12260	12400	9980	32300	11660	11680	20920	14460	2750
Mn	2067	1964	1922	2218	2384	2371	2251	1996	1982
Fe	46800	41900	43200	43300	50600	50500	43500	48900	53800
Co	45.6	44.7	44.7	42.8	46.2	46.5	43.2	47.5	48.7
Ni	103.2	106.2	109.9	105.9	63.2	64.4	74.9	107.5	107.2
Cu	0.402	0.615	0.582	0.682	0.490	0.439	0.436	0.555	0.429
Zn	17.60	13.82	16.25	12.95	16.12	15.90	12.35	17.23	22.96
Ga	12.75	11.07	11.93	9.34	10.95	11.19	10.32	12.73	16.33
Rb	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Sr	0.572	0.391	0.390	0.565	0.330	0.301	0.235	0.474	0.297
Y	17.71	16.09	17.60	13.79	14.52	14.48	9.98	20.51	24.73
Zr	61.8	58.9	66.4	68.1	54.8	54.2	32.1	60.3	80.0
Nb	0.471	0.184	0.159	0.261	0.187	0.171	0.190	0.223	0.397
Cs	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Ba	bdl	bdl	0.0100	bdl	0.0649	0.0260	bdl	0.0083	bdl
La	0.0699	0.0159	0.0184	0.0359	0.0225	0.0125	0.0235	0.0337	0.0212
Ce	0.329	0.211	0.231	0.340	0.151	0.151	0.142	0.296	0.157
Pr	0.1018	0.0946	0.0852	0.127	0.0498	0.0458	0.0437	0.1160	0.0692
Nd	0.983	1.096	0.951	1.301	0.516	0.685	0.649	1.100	0.865
Sm	0.916	0.928	0.744	1.015	0.512	0.602	0.381	0.862	0.885
Eu	0.442	0.430	0.473	0.452	0.278	0.267	0.315	0.403	0.429
Gd	1.85	1.617	1.95	2.07	1.340	1.249	1.161	1.81	2.05
Tb	0.365	0.356	0.342	0.365	0.289	0.273	0.229	0.396	0.484
Dy	2.82	2.52	2.87	2.66	2.29	2.37	1.490	3.22	3.79
Ho	0.700	0.603	0.654	0.575	0.584	0.561	0.335	0.722	0.965
Er	1.877	1.885	1.969	1.325	1.778	1.901	1.108	2.50	2.87
Tm	0.290	0.276	0.287	0.192	0.280	0.272	0.194	0.341	0.433
Yb	2.26	2.19	1.973	1.211	1.965	2.093	1.456	2.72	3.14
Lu	0.322	0.299	0.299	0.217	0.339	0.343	0.216	0.407	0.467
Hf	1.525	1.375	1.705	1.653	1.331	1.314	0.747	1.589	1.777
Ta	0.0187	0.0243	0.0142	0.0214	0.0265	0.0166	0.0267	0.0240	0.0286
Pb	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Th	bdl	0.0137	bdl	bdl	bdl	bdl	bdl	0.0091	0.0087
U	0.0171	0.0137	0.0097	0.0244	0.0088	0.0083	bdl	bdl	0.0173

A7.2. Trace-element composition of garnet xenocrysts. Rock type and metasomatism obtained from GEOSPEED software. Data in ppm. Values below detection limit are represented by "bdl", whereas the not analysed elements, by "NA"

# Label	31_32	31_33	31_34	31_35	31_36	31_37	31_38	31_39a	31_39b
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Rock Type (Ca, Cr)	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Ca harzburgite	Lherzolite	Lherzolite	Ca harzburgite
Li	0.43	0.39	bdl	bdl	0.263	bdl	bdl	bdl	bdl
Be	0.068	bdl	bdl	bdl	0.102	bdl	bdl	bdl	bdl
B	1.86	0.97	1.30	1.15	1.53	1.56	1.16	2.07	1.43
Na	708	664	494	646	247.2	329	228.7	646	275.3
Mg	128500	125900	127800	130100	125700	120800	127100	124300	126000
Al	102900	104800	102900	106800	99800	94600	98100	102000	96400
Si	199200	197600	199100	197700	197500	194500	198700	196700	196000
P	147	154	153	143	183	233	95.6	146	84.6
K	2.49	bdl	3.55	bdl	bdl	bdl	2.12	bdl	1.74
Ca	26950	28650	30150	29810	36200	31500	33600	30600	29090
Sc	76.4	73.4	87.2	81.9	131.8	116.6	70.7	90.2	128.3
Ti	4640	5590	3720	4910	1938	823	1010	5000	525
V	221.2	241.5	245.1	244.5	405	208.1	193.9	269.0	283.7
Cr	14230	11590	20540	14170	31600	41200	29300	19440	39600
Mn	1866	1963	2041	2002	2119	2986	1976	2249	2679
Fe	44500	50000	44200	44700	43000	44700	40800	49100	41600
Co	45.0	45.9	43.8	43.3	42.9	39.3	43.3	44.3	40.1
Ni	119.9	117.1	103.8	105.4	104.7	34.2	101.2	96.5	48.1
Cu	0.425	0.605	0.476	0.624	0.374	0.089	0.450	0.633	bdl
Zn	15.93	19.16	15.10	16.06	13.87	8.81	12.77	15.21	9.63
Ga	11.26	13.47	9.58	10.93	10.20	5.80	8.55	11.64	3.87
Rb	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.128	bdl
Sr	0.574	0.556	0.544	0.520	0.544	0.554	0.508	0.432	0.541
Y	18.17	24.13	11.24	18.78	5.06	15.60	3.36	18.34	1.790
Zr	59.5	73.7	55.2	65.7	51.4	64.7	10.72	71.4	20.48
Nb	0.254	0.182	0.277	0.225	0.306	0.305	0.596	0.188	0.172
Cs	bdl	bdl	bdl	bdl	0.072	bdl	bdl	bdl	bdl
Ba	bdl	bdl	0.0080	bdl	bdl	bdl	0.0175	bdl	bdl
La	0.0389	0.0155	0.0370	0.0172	0.0483	0.0357	0.0424	0.0333	0.0348
Ce	0.338	0.364	0.348	0.328	0.480	0.677	0.409	0.302	0.568
Pr	0.0997	0.1167	0.1186	0.127	0.192	0.287	0.145	0.0988	0.287
Nd	1.188	1.079	1.209	1.150	1.93	3.14	1.128	1.063	2.81
Sm	0.819	1.125	0.988	1.052	1.188	2.10	0.396	0.913	1.146
Eu	0.475	0.588	0.464	0.475	0.480	0.888	0.187	0.421	0.321
Gd	1.787	2.54	1.641	1.96	1.503	3.36	0.481	1.98	0.630
Tb	0.345	0.472	0.303	0.411	0.138	0.464	0.0898	0.430	0.0879
Dy	2.89	4.24	2.114	3.18	0.879	2.87	0.577	3.28	0.298
Ho	0.664	0.961	0.437	0.765	0.194	0.574	0.133	0.704	0.0583
Er	2.066	2.62	1.235	2.48	0.651	1.530	0.366	2.120	0.250
Tm	0.292	0.407	0.176	0.343	0.1138	0.207	0.0535	0.301	0.0283
Yb	2.070	2.68	1.321	2.36	0.995	1.463	0.335	2.13	0.457
Lu	0.339	0.432	0.235	0.380	0.183	0.219	0.0475	0.351	0.1131
Hf	1.576	1.819	1.232	1.695	1.035	0.734	0.249	1.791	0.398
Ta	0.0191	0.0167	0.0199	0.0250	0.0263	0.0239	0.0717	0.0261	0.0318
Pb	bdl	bdl	bdl	bdl	bdl	0.015	bdl	bdl	bdl
Th	0.0164	bdl	0.0111	bdl	bdl	0.0131	0.0153	bdl	0.0218
U	bdl	0.0159	0.0134	0.0195	0.0292	0.0318	0.0442	0.0174	0.0346

A7.2. Trace-element composition of garnet xenocrysts. Rock type and metasomatism obtained from GEOSPEED software. Data in ppm. Values below detection limit are represented by "bdl", whereas the not analysed elements, by "NA"

# Label	31_40	31_41L	31_42p	13b_43	13b_44	13b_45	13b_46	13b_46	13b_47
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Rock Type (Ca, Cr)	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Ca harzburgite	Lherzolite	Lherzolite	Lherzolite	Low-Cr garnets
Li	bdl	0.25	0.43	0.268	0.257	bdl	bdl	0.42	0.35
Be	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
B	1.37	1.80	1.16	bdl	1.16	1.52	bdl	1.09	1.92
Na	566	575	614	558	366	453	450	551	698
Mg	126300	130000	125900	125700	128200	128600	125100	127200	129000
Al	101700	105300	95300	101900	86800	102500	107000	105800	105200
Si	197300	197900	196100	195800	193000	197500	197100	197100	197500
P	133	162	167	145.9	80.1	134.9	127.0	150	195
K	2.81	1.83	3.10	3.68	3.33	bdl	2.00	bdl	bdl
Ca	30700	30700	33000	32180	24970	29980	29790	28320	26820
Sc	85.3	74.9	89.1	93.8	130.4	63.0	78.2	75.2	65.2
Ti	4570	4950	5550	4820	1054	3133	3690	4540	4980
V	237.9	247.3	266.7	294.9	322.8	214.5	243.0	258.9	233.2
Cr	18900	15690	29100	19610	56100	15740	10290	8220	8270
Mn	2035	2001	2060	2284	2857	1905	2143	1923	1706
Fe	46600	43200	44100	50800	42200	48500	53400	50400	50600
Co	44.3	43.4	42.6	44.9	40.4	46.5	49.2	46.7	48.3
Ni	104.6	109.5	114.4	93.2	44.6	113.5	91.1	112.6	136.2
Cu	0.583	0.685	0.698	0.682	0.125	1.413	0.522	0.622	0.561
Zn	15.78	14.07	14.89	14.70	9.70	15.80	18.59	17.71	21.38
Ga	10.65	11.47	10.91	12.04	3.49	13.12	12.63	12.60	13.78
Rb	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.201	bdl
Sr	0.598	0.447	0.734	0.426	0.499	0.432	0.379	0.533	0.643
Y	15.21	17.58	19.66	17.70	1.447	11.80	15.08	20.02	19.56
Zr	53.1	74.3	79.1	75.0	24.67	43.2	67.4	61.4	56.1
Nb	0.229	0.245	0.253	0.242	0.089	0.185	0.208	0.159	0.312
Cs	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Ba	bdl	0.0145	bdl	0.0454	0.0126	bdl	bdl	bdl	bdl
La	0.0230	0.0243	0.0457	0.0373	0.0178	0.0393	0.0192	0.0272	0.0329
Ce	0.348	0.253	0.456	0.295	0.344	0.340	0.223	0.313	0.368
Pr	0.126	0.1240	0.163	0.114	0.1039	0.116	0.1004	0.1072	0.1079
Nd	1.274	1.062	1.492	1.298	1.174	0.897	1.036	1.362	1.299
Sm	0.893	0.953	1.471	0.880	0.478	0.608	0.647	1.014	0.849
Eu	0.486	0.470	0.646	0.482	0.152	0.317	0.480	0.423	0.403
Gd	1.693	1.82	2.46	1.92	0.372	1.40	1.63	1.60	1.83
Tb	0.316	0.404	0.491	0.390	0.0495	0.266	0.330	0.409	0.379
Dy	2.26	3.04	3.30	2.98	0.343	1.94	2.18	3.25	3.14
Ho	0.536	0.686	0.732	0.685	0.0489	0.409	0.585	0.812	0.721
Er	1.585	2.004	2.134	2.051	0.174	1.223	1.557	2.52	2.308
Tm	0.256	0.307	0.322	0.327	0.0147	0.196	0.266	0.364	0.358
Yb	1.801	2.34	2.10	2.03	0.122	1.216	1.845	2.87	2.64
Lu	0.271	0.411	0.308	0.340	0.0546	0.184	0.270	0.417	0.381
Hf	1.122	1.932	2.243	1.931	0.623	1.117	1.490	1.667	1.332
Ta	0.0277	0.0220	0.0274	0.0250	0.0023	0.0284	0.0183	0.0264	0.0436
Pb	bdl	bdl	0.017	bdl	bdl	bdl	bdl	bdl	bdl
Th	bdl	bdl	bdl	0.0124	0.0048	0.0155	bdl	bdl	0.0182
U	bdl	0.0152	0.0149	0.0245	0.0097	0.028	0.0221	0.0111	0.0163

A7.2. Trace-element composition of garnet xenocrysts. Rock type and metasomatism obtained from GEOSPEED software. Data in ppm. Values below detection limit are represented by "bdl", whereas the not analysed elements, by "NA"

# Label	13b_48bo	13b_49	13b_49d	13b_50	13b_51	13b_52	13b_56	13b_57	35_78
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Rock Type (Ca, Cr)	Low-Cr garnets	Lherzolite	Lherzolite	Lherzolite	Low-Cr garnets	Low-Cr garnets	Ca harzburgite	Lherzolite	Lherzolite
Li	21.80	bdl	bdl	0.35	0.36	bdl	bdl	bdl	bdl
Be	0.96	bdl	0.015	bdl	bdl	0.208	bdl	bdl	bdl
B	7.69	bdl	1.84	0.84	1.40	1.45	1.31	1.30	1.79
Na	9940	329	348	648	697	328	380	829	661
Mg	58100	121700	121800	131600	133300	129000	129500	118900	129600
Al	21590	99800	98900	106600	109800	109700	109100	87400	103900
Si	183200	193800	195200	198300	199300	199500	198700	191400	194300
P	24.4	119.6	122.9	141	135	144	169	153	162.6
K	2.31	3.53	bdl	bdl	2.27	2.28	3.69	bdl	2.93
Ca	112900	31480	31990	25910	26830	32800	25130	35900	29810
Sc	54.5	101.8	104.4	69.9	74.0	65.1	80.7	101.2	76.2
Ti	2167	1151	1251	4200	4540	2733	767	6690	4570
V	294.3	253.0	273.7	201.1	215.3	190.8	143.1	352	228.0
Cr	188.4	30800	32260	9500	6390	6610	16400	38800	14800
Mn	287.2	3038	3140	1793	1938	1758	2676	2522	2016
Fe	35200	47500	47400	49000	48700	53900	48000	53100	47000
Co	38.6	39.3	39.5	46.8	46.0	55.3	43.0	41.3	44.6
Ni	106.4	30.8	29.18	128.3	115.0	149.5	39.9	84.9	106.4
Cu	0.125	bdl	bdl	0.568	0.326	0.982	0.172	0.511	0.755
Zn	95.4	8.92	8.78	19.28	16.66	19.82	10.76	16.61	21.44
Ga	13.48	8.59	8.45	11.40	11.34	15.74	7.02	16.75	11.57
Rb	bdl	bdl	bdl	bdl	bdl	bdl	0.154	bdl	bdl
Sr	17.89	0.214	0.330	0.616	0.609	0.441	0.321	0.526	0.442
Y	4.89	9.99	10.14	17.19	17.20	15.93	9.34	21.32	16.63
Zr	95.2	23.57	23.32	46.3	55.0	25.54	43.3	73.2	62.0
Nb	bdl	0.0726	0.0702	0.262	0.206	0.285	0.227	0.346	0.196
Cs	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Ba	0.0897	bdl	bdl	bdl	0.0201	0.0139	0.0033	bdl	0.0337
La	4.72	0.0226	0.0190	0.0492	0.0368	0.0274	bdl	0.0305	0.0324
Ce	24.11	0.186	0.175	0.350	0.276	0.367	0.243	0.383	0.317
Pr	4.90	0.0618	0.0848	0.110	0.0754	0.1010	0.107	0.123	0.1175
Nd	25.78	0.857	1.218	0.978	1.133	1.035	1.113	1.547	1.102
Sm	4.90	0.869	0.773	0.749	0.779	0.504	1.172	1.107	1.062
Eu	1.055	0.345	0.377	0.293	0.474	0.254	0.418	0.501	0.522
Gd	3.07	1.421	1.404	1.60	1.79	1.171	1.55	2.14	1.79
Tb	0.346	0.256	0.236	0.293	0.326	0.252	0.238	0.461	0.374
Dy	1.651	1.755	1.648	2.74	2.80	2.14	1.503	3.89	2.68
Ho	0.223	0.407	0.358	0.612	0.625	0.627	0.332	0.827	0.602
Er	0.428	1.251	1.077	2.100	2.043	2.106	0.869	2.82	2.111
Tm	0.0424	0.146	0.177	0.306	0.279	0.340	0.139	0.366	0.287
Yb	0.203	1.292	1.542	2.60	2.37	2.26	0.873	2.45	2.10
Lu	0.0056	0.218	0.204	0.383	0.318	0.334	0.146	0.396	0.333
Hf	3.03	0.467	0.459	1.195	1.387	0.667	0.269	1.741	1.293
Ta	bdl	0.0108	bdl	0.0292	bdl	0.0352	0.0296	0.0426	0.0225
Pb	0.165	bdl	0.047	bdl	bdl	bdl	bdl	bdl	0.1
Th	0.0265	0.0171	0.0083	bdl	0.0148	0.0185	bdl	0.0103	bdl
U	bdl	0.0663	0.0644	0.0199	0.0127	0.0154	bdl	0.0259	0.026

A7.2. Trace-element composition of garnet xenocrysts. Rock type and metasomatism obtained from GEOSPEED software. Data in ppm. Values below detection limit are represented by "bdl", whereas the not analysed elements, by "NA"

# Label	35_78	35_81	35_82	13c_01	13c_02	13c_03	13c_04	13c_04b	13c_05
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Rock Type (Ca, Cr)	Lherzolite	Lherzolite	Low-Cr garnets	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Low-Cr garnets	Lherzolite
Li	0.339	bdl	0.44	bdl	bdl	0.313	bdl	bdl	0.506
Be	bdl	bdl	bdl	bdl	bdl	0.156	bdl	bdl	bdl
B	1.60	bdl	3.18	1.33	1.53	1.20	2.23	1.41	1.34
Na	585	659	838	723	183.4	672	374	688	680
Mg	120600	127900	163700	129600	121800	127900	119800	125500	129300
Al	105100	102300	129200	108300	103400	105200	88500	107800	103800
Si	194300	196600	243100	200400	197400	198400	189300	198300	198800
P	132.9	145.0	170	153	86.9	160	132.2	134.9	153
K	bdl	1.99	bdl	bdl	bdl	3.63	4.20	bdl	bdl
Ca	35300	30680	32000	28410	32350	28120	36500	25780	27810
Sc	121.2	91.7	88.7	75.4	98.7	74.1	128.4	78.1	73.9
Ti	2232	5060	5230	5270	1064	4470	3140	4420	4970
V	125.3	265.7	262.6	214.4	263.6	225.8	294.4	213.2	222.5
Cr	22270	19790	14190	10470	23320	13070	39400	6760	15130
Mn	3550	2286	2259	2015	2517	2028	2118	2107	1822
Fe	56000	52800	61600	52100	47800	47000	41800	53800	48600
Co	41.3	45.6	56.5	47.8	43.6	44.0	40.7	48.2	46.0
Ni	44.9	98.6	159.3	117.9	57.4	100.8	97.8	81.8	130.9
Cu	0.211	bdl	0.758	0.650	0.345	0.739	0.427	0.605	0.507
Zn	14.34	16.69	22.94	19.34	11.77	15.42	12.17	19.18	19.02
Ga	11.49	12.11	14.13	11.76	9.48	12.03	7.38	12.86	11.69
Rb	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Sr	0.250	0.504	0.763	0.536	0.0664	0.394	1.138	0.337	0.659
Y	41.9	19.46	22.54	23.14	7.28	17.25	4.54	19.33	18.81
Zr	171.7	bdl	56.9	89.4	11.51	57.5	27.37	55.1	59.8
Nb	0.199	0.180	0.294	0.175	0.0772	0.230	0.488	0.204	0.256
Cs	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Ba	bdl	bdl	bdl	bdl	bdl	0.0207	0.0208	bdl	0.0053
La	0.0182	0.0158	0.0512	0.0192	0.0145	0.0352	0.1093	0.0275	0.0443
Ce	0.174	bdl	0.475	0.278	0.0831	0.247	0.560	0.259	0.422
Pr	0.0793	0.118	0.132	0.1156	0.0422	0.0978	0.218	0.0892	0.1245
Nd	1.000	1.188	1.469	1.194	0.300	0.884	2.00	0.866	1.342
Sm	1.010	0.924	0.892	1.040	0.281	0.925	1.087	0.607	1.081
Eu	0.694	0.517	0.498	0.554	0.117	0.425	0.466	0.346	0.450
Gd	3.02	1.94	1.95	2.33	0.516	1.596	0.979	1.568	1.92
Tb	0.768	0.402	0.425	0.500	0.1192	0.380	0.161	0.328	0.392
Dy	7.03	3.56	3.68	4.03	1.090	2.98	0.834	2.97	3.00
Ho	1.728	0.793	0.837	0.918	0.254	0.643	0.173	0.756	0.738
Er	5.32	2.20	2.64	2.59	0.858	1.953	0.449	2.346	2.189
Tm	0.772	0.336	0.398	0.354	0.1321	0.307	0.0659	0.367	0.344
Yb	5.53	2.41	2.99	2.80	1.124	2.060	0.472	2.66	2.35
Lu	0.813	0.348	0.416	0.419	0.180	0.333	0.0868	0.395	0.340
Hf	3.42	1.959	1.477	2.263	0.307	1.313	0.494	1.399	1.549
Ta	0.0132	0.0112	0.0296	0.0231	bdl	0.0278	0.0598	0.0219	0.0182
Pb	bdl	0.0169	0.043	bdl	bdl	bdl	0.229	bdl	bdl
Th	bdl	0.0116	bdl	bdl	bdl	bdl	0.0209	0.009	bdl
U	bdl	0.0144	0.0249	bdl	bdl	0.0103	0.0252	0.0117	0.0195

A7.2. Trace-element composition of garnet xenocrysts. Rock type and metasomatism obtained from GEOSPEED software. Data in ppm. Values below detection limit are represented by "bdl", whereas the not analysed elements, by "NA"

# Label	13c_06	13c_07	13c_08	13c_09	13c_11	13c_12	13c_13	13c_14	13c_15
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Rock Type (Ca, Cr)	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite
Li	0.444	bdl	0.455	0.538	0.285	0.246	bdl	bdl	bdl
Be	0.190	0.063	bdl	bdl	0.095	bdl	bdl	bdl	bdl
B	1.44	1.63	1.44	1.20	0.88	1.77	1.34	0.89	1.17
Na	679	660	830	635	332	699	707	511	130.2
Mg	122800	129500	127600	128500	119200	130400	127100	128000	115300
Al	100900	105300	98600	106800	92000	107800	96900	104500	92900
Si	196600	201400	197800	199400	194000	201000	198400	198500	193600
P	126.0	139	130	236	168	132	119.2	145	67.0
K	26.2	3.06	bdl	2.72	3.54	bdl	2.63	bdl	3.87
Ca	30570	25890	30090	27440	37100	26840	31210	29790	39300
Sc	90.9	71.0	83.4	69.4	112.1	74.9	75.6	73.2	107.0
Ti	5070	4280	5420	4370	2167	4300	6090	4110	818
V	260.4	225.7	256.8	227.3	288.7	198.7	258.6	210.5	308.3
Cr	18590	9180	23460	9340	40900	11560	24760	14570	42700
Mn	2296	1787	2033	1955	2662	1924	1863	2021	2872
Fe	51300	48100	46200	49000	46800	50000	52000	46000	44900
Co	45.9	47.3	42.8	45.5	41.2	48.2	47.9	44.8	40.4
Ni	94.5	132.4	117.1	113.1	59.4	122.1	136.1	100.6	40.6
Cu	0.752	0.690	0.631	0.315	0.356	0.623	0.656	0.545	bdl
Zn	16.65	19.02	16.83	16.47	11.19	19.90	20.57	12.90	10.15
Ga	12.47	13.81	13.63	12.57	8.84	10.61	12.16	10.93	5.93
Rb	0.278	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Sr	1.050	0.563	0.683	0.679	0.410	0.574	0.910	0.369	0.100
Y	19.82	17.47	23.98	17.29	11.20	17.39	23.06	16.32	1.413
Zr	67.3	42.7	67.0	52.2	53.5	48.1	72.4	67.7	16.79
Nb	0.299	0.253	0.185	0.216	0.342	0.244	0.382	0.223	0.150
Cs	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Ba	0.168	bdl	0.0033	bdl	0.0297	bdl	bdl	0.0022	bdl
La	0.330	0.0258	0.0415	0.1033	0.0280	0.0341	0.0527	0.0248	0.0825
Ce	0.649	0.349	0.388	0.421	0.352	0.305	0.591	0.240	0.330
Pr	0.1276	0.1130	0.135	0.168	0.137	0.133	0.179	0.1142	0.0838
Nd	0.999	1.085	1.255	1.631	1.477	1.068	1.648	1.153	1.033
Sm	1.044	0.801	1.019	0.963	1.167	0.747	1.273	0.838	0.425
Eu	0.435	0.405	0.537	0.379	0.443	0.368	0.650	0.487	0.128
Gd	1.762	1.582	2.35	1.554	1.613	1.545	2.63	1.84	0.326
Tb	0.410	0.324	0.494	0.332	0.289	0.329	0.524	0.347	0.0282
Dy	3.28	2.57	3.88	2.73	1.973	2.89	3.69	2.62	0.252
Ho	0.751	0.607	0.936	0.668	0.414	0.646	0.853	0.642	0.0564
Er	2.185	1.932	2.74	1.954	1.279	2.037	2.392	1.798	0.148
Tm	0.328	0.311	0.369	0.305	0.172	0.319	0.337	0.265	0.0219
Yb	2.22	2.22	2.24	2.28	1.285	2.19	2.38	1.930	0.225
Lu	0.330	0.314	0.343	0.307	0.213	0.326	0.367	0.322	0.0537
Hf	1.663	1.043	1.798	1.079	1.281	1.160	1.643	1.603	0.473
Ta	0.0185	0.0315	0.0091	0.0240	0.0415	0.0146	0.0432	0.0281	0.0145
Pb	0.064	bdl	bdl	bdl	bdl	0.028	bdl	bdl	bdl
Th	0.0097	bdl	bdl	bdl	0.0106	bdl	0.0279	0.0088	0.0144
U	0.0204	0.0171	bdl	0.019	0.0232	0.0167	0.0277	bdl	0.0373

A7.2. Trace-element composition of garnet xenocrysts. Rock type and metasomatism obtained from GEOSPEED software. Data in ppm. Values below detection limit are represented by "bdl", whereas the not analysed elements, by "NA"

# Label	32a_87	32a_87	32a_88	32a_89	32a_90	32a_90b	32a_92	32a_93	32a_94
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Rock Type (Ca, Cr)	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite
Li	0.39	bdl	bdl	bdl	bdl	0.50	bdl	0.35	bdl
Be	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
B	1.97		1.73	2.40	1.36	1.98	1.33	1.89	0.85
Na	720	591	559	606	464	711	484	503	708
Mg	127000	129800	130600	131600	120600	126800	129400	132600	128700
Al	106600	103800	105200	108300	88900	104000	106600	110000	102500
Si	198300	198300	197500	197900	193100	195200	197700	198100	197400
P	117.3	147.0	147.1	155.2	170	150.8	82.3	147.6	127.5
K	bdl	bdl	111.2	bdl	1.86	bdl	2.27	2.91	2.61
Ca	24950	28870	29640	28180	38700	28080	29160	29300	29870
Sc	81.2	79.5	75.9	71.0	88.5	71.5	87.1	77.1	80.5
Ti	4280	4180	4680	4250	4850	4760	2093	4310	5680
V	195.3	235.5	232.0	238.2	302.2	223.1	216.2	253.4	248.4
Cr	11890	15930	12750	10880	40700	12040	18780	9380	15440
Mn	2516	2029	2017	2048	2241	2041	2050	2100	2093
Fe	59800	49400	49200	52000	54400	52700	50800	50800	49300
Co	45.2	45.1	45.8	46.5	46.2	46.4	45.0	44.9	45.0
Ni	71.0	105.2	109.2	107.8	95.5	101.5	91.3	107.5	106.3
Cu	0.496	0.317	0.572	0.575	0.558	0.666	0.471	0.529	0.842
Zn	19.57	15.76	15.62	18.06	16.61	17.66	17.56	15.91	15.57
Ga	11.06	10.98	11.02	13.27	12.83	11.89	9.83	12.31	11.65
Rb	bdl	bdl	0.591	bdl	bdl	bdl	bdl	bdl	bdl
Sr	0.288	0.434	0.581	0.419	0.642	0.434	0.367	0.447	0.410
Y	17.43	15.80	16.46	17.10	21.69	17.26	12.87	17.58	16.26
Zr	43.4	58.6	68.6	49.1	87.0	57.3	10.77	62.2	66.0
Nb	0.156	0.276	0.197	0.227	0.412	0.231	0.268	0.214	0.224
Cs	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Ba	bdl	bdl	0.183	0.0175	0.0074	bdl	bdl	0.0170	0.0146
La	0.0087	0.0178	0.0179	0.0242	0.0403	0.0146	0.0249	0.0120	0.0247
Ce	0.134	0.289	0.275	0.256	0.568	0.226	0.320	0.252	0.292
Pr	0.0478	0.0991	0.108	0.0999	0.200	0.0840	0.0913	0.0907	0.0879
Nd	0.488	0.835	1.205	0.956	2.02	0.869	0.898	1.078	0.904
Sm	0.418	0.754	0.815	0.872	1.364	0.738	0.301	0.882	0.846
Eu	0.269	0.402	0.351	0.406	0.679	0.440	0.188	0.372	0.379
Gd	1.288	1.625	2.01	1.78	2.85	1.83	0.780	1.69	1.81
Tb	0.241	0.352	0.367	0.361	0.507	0.370	0.190	0.391	0.396
Dy	2.62	2.49	2.84	2.74	3.80	2.71	1.672	2.91	2.84
Ho	0.665	0.614	0.635	0.638	0.904	0.622	0.449	0.666	0.609
Er	2.196	1.720	1.813	2.046	2.374	2.073	1.692	2.062	1.642
Tm	0.396	0.287	0.281	0.309	0.320	0.306	0.262	0.320	0.224
Yb	2.72	2.09	1.883	2.18	2.083	2.18	2.10	2.21	1.991
Lu	0.436	0.283	0.293	0.305	0.343	0.307	0.325	0.383	0.311
Hf	1.100	1.418	1.699	1.142	2.129	1.298	0.282	1.574	1.472
Ta	0.0205	0.0135	0.0245	0.0196	0.0469	0.0198	0.0343	0.0166	0.0223
Pb	bdl	0.0113	bdl	bdl	bdl	bdl	0.019	bdl	bdl
Th	bdl	0.0203	0.0063	bdl	bdl	0.0081	0.0147	0.012	0.0152
U	bdl	0.0141	bdl	0.0226	0.0385	bdl	0.0185	0.0199	0.0168

A7.2. Trace-element composition of garnet xenocrysts. Rock type and metasomatism obtained from GEOSPEED software. Data in ppm. Values below detection limit are represented by "bdl", whereas the not analysed elements, by "NA"

# Label	32a_95	32a_95b	32a_96	32a_97	32a_98	31_b_076	15A-f-87	26_a_003	26_d_009
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Rock Type (Ca, Cr)	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite
Li	0.391	bdl	bdl	0.53	bdl	NA	NA	NA	NA
Be	bdl	bdl	bdl	bdl	bdl	NA	NA	NA	NA
B	1.08	1.16	1.70	1.64	1.55	NA	NA	NA	NA
Na	383	414	489	643	137.8	NA	NA	NA	NA
Mg	119800	119400	132100	133400	131200	NA	NA	NA	NA
Al	104600	103800	105200	109700	99600	NA	NA	NA	NA
Si	195800	193600	197500	197900	197100	NA	NA	NA	NA
P	108.7	118.6	137.1	134.6	81.8	NA	NA	NA	NA
K	bdl	bdl	3.08	2.65	2.49	NA	NA	NA	NA
Ca	31520	31160	29610	27260	34000	NA	NA	NA	NA
Sc	89.6	88.7	77.5	70.1	98.2	72.7	67.8	81.1	63.3
Ti	1309	1340	3930	4380	723	4230	4680	2620	5090
V	212.9	219.9	248.6	216.3	232.8	254	233	246	215
Cr	25230	25300	14420	9020	30150	18880	12930	33100	8910
Mn	3580	3700	1961	2038	2071	bdl	1999	2670	2040
Fe	55200	54200	45800	49600	39500	NA	NA	NA	NA
Co	38.7	37.9	44.5	44.9	41.4	41.5	43.9	39.2	45.7
Ni	18.09	17.98	105.5	101.4	104.5	110.3	114.2	44.9	112.4
Cu	bdl	0.126	0.828	0.581	0.319	NA	NA	NA	NA
Zn	9.23	9.26	14.84	17.90	12.67	NA	NA	NA	NA
Ga	8.52	8.38	12.33	13.07	7.99	9.58	11.10	8.06	11.29
Rb	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Sr	0.143	0.271	0.434	0.399	0.393	0.476	0.372	bdl	0.357
Y	15.49	14.06	15.36	17.67	6.29	13.37	13.20	5.63	14.16
Zr	19.32	19.84	51.8	50.3	2.119	49.3	55.0	35.7	44.4
Nb	0.0570	0.096	0.209	0.224	0.616	0.226	0.236	bdl	0.256
Cs	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Ba	bdl	0.0231	0.0323	0.0097	0.0150	bdl	bdl	bdl	bdl
La	0.0099	0.0147	0.0208	0.0124	0.0647	0.0324	bdl	0.249	bdl
Ce	0.146	0.186	0.302	0.247	0.484	0.341	0.272	0.764	0.255
Pr	0.0786	0.094	0.112	0.0701	0.150	0.0897	0.0830	0.206	0.0850
Nd	1.146	1.188	1.014	0.803	1.049	0.911	0.859	2.26	0.723
Sm	0.835	0.670	0.842	0.757	0.186	0.788	0.723	1.510	0.691
Eu	0.365	0.425	0.408	0.387	0.0589	0.422	0.343	0.527	0.363
Gd	1.408	1.169	1.64	1.46	0.428	1.550	1.460	1.310	1.490
Tb	0.300	0.282	0.322	0.338	0.0908	0.304	0.292	0.1850	0.289
Dy	2.21	2.27	2.67	2.96	0.848	2.26	2.29	1.115	2.55
Ho	0.571	0.553	0.619	0.631	0.263	0.501	0.496	0.220	0.599
Er	1.727	1.485	1.799	2.13	0.875	1.440	1.600	0.601	1.730
Tm	0.256	0.227	0.263	0.312	0.134	0.217	0.259	0.0800	0.256
Yb	1.811	1.76	2.20	2.41	0.999	1.540	1.660	0.658	1.920
Lu	0.278	0.308	0.268	0.371	0.145	0.218	0.257	0.1000	0.307
Hf	0.382	0.317	1.217	1.054	0.061	1.110	1.148	0.638	1.104
Ta	bdl	bdl	0.0317	0.0200	0.0420	bdl	0.01960	bdl	0.01870
Pb	bdl	bdl	bdl	0.0119	bdl	NA	NA	NA	NA
Th	0.0117	0.0212	bdl	0.0117	0.0281	NA	NA	NA	NA
U	0.0166	0.0522	bdl	bdl	0.0394	NA	NA	NA	NA

A7.2. Trace-element composition of garnet xenocrysts. Rock type and metasomatism obtained from GEOSPEED software. Data in ppm. Values below detection limit are represented by "bdl", whereas the not analysed elements, by "NA"

# Label	26_e_012	26_g_019	26_j_034	32A_c_080	32A_e_085	34_c_014	35_g_052	42_e_163	6A(2)_x_089
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Rock Type (Ca, Cr)	Lherzolite	Wehrlite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite	Lherzolite
Li	NA	NA	NA	NA	NA	NA	NA	NA	NA
Be	NA	NA	NA	NA	NA	NA	NA	NA	NA
B	NA	NA	NA	NA	NA	NA	NA	NA	NA
Na	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Al	NA	NA	NA	NA	NA	NA	NA	NA	NA
Si	NA	NA	NA	NA	NA	NA	NA	NA	NA
P	NA	NA	NA	NA	NA	NA	NA	NA	NA
K	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ca	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sc	72.2	126.0	73.0	63.5	62.3	84.9	68.9	79.0	116.3
Ti	6220	3220	5590	4540	4960	4890	4460	5240	2830
V	238	191.2	259	235	213	315	285	276	326
Cr	20400	53700	15610	11290	12970	39600	14970	19500	55000
Mn	1850	4140	2130	2130	2070	2280	bdl	2290	2500
Fe	NA	NA	NA	NA	NA	NA	NA	NA	NA
Co	41.4	36.6	47.1	48.6	47.2	47.6	45.7	45.2	41.9
Ni	111.6	35.4	116.3	110.2	102.1	93.0	112.7	96.9	105.4
Cu	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zn	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ga	11.10	13.75	10.90	12.08	11.73	12.55	11.30	11.60	9.73
Rb	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Sr	bdl	0.760	0.357	0.388	0.393	0.518	0.445	0.376	1.640
Y	18.30	37.3	14.63	13.50	13.12	15.43	14.10	14.07	7.10
Zr	64.4	157.5	65.4	40.6	46.8	72.8	55.8	57.2	29.5
Nb	0.243	0.300	0.218	bdl	0.226	0.359	0.363	0.240	0.960
Cs	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Ba	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
La	bdl	bdl	bdl	bdl	bdl	bdl	0.0900	bdl	0.255
Ce	0.535	0.667	0.282	0.274	0.237	0.487	0.417	0.276	2.58
Pr	0.1570	0.241	0.0800	bdl	0.0700	0.1680	0.1033	0.0910	0.809
Nd	1.230	2.26	0.919	0.750	0.672	1.620	1.059	0.940	7.35
Sm	0.850	2.22	0.904	0.740	0.637	1.350	0.809	0.880	3.19
Eu	0.452	1.200	0.390	0.381	0.343	0.649	0.410	0.431	0.934
Gd	1.810	4.18	1.620	1.430	1.380	2.34	1.620	1.490	1.960
Tb	0.391	0.924	0.334	0.285	0.274	0.430	0.316	0.331	0.254
Dy	3.17	7.34	2.35	2.46	2.23	3.26	2.29	2.72	1.520
Ho	0.650	1.529	0.532	0.540	0.475	0.645	0.493	0.644	0.254
Er	1.960	4.05	1.670	1.690	1.490	1.830	1.560	1.840	0.870
Tm	0.258	0.551	0.242	0.227	0.235	0.326	0.226	0.290	0.1680
Yb	1.600	3.63	1.760	1.680	1.680	2.07	1.630	1.860	1.380
Lu	0.242	0.420	0.242	0.266	0.237	0.314	0.253	0.266	0.254
Hf	1.466	2.91	1.330	0.861	1.012	1.706	1.320	1.500	0.618
Ta	bdl	0.0236	0.01610	bdl	0.01680	0.0308	bdl	bdl	0.1340
Pb	NA	NA	NA	NA	NA	NA	NA	NA	NA
Th	NA	NA	NA	NA	NA	NA	NA	NA	NA
U	NA	NA	NA	NA	NA	NA	NA	NA	NA

A7.2. Trace-element composition of garnet xenocrysts. Rock type and metasomatism obtained from GEOSPEED software. Data in ppm. Values below detection limit are represented by "bdl", whereas the not analysed elements, by "NA"

# Label	6A(2)_y_098	6A(2)_y2_102	6A_b_038	6A_f_063	6A_g_065
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Rock Type (Ca, Cr)	**Lherzolite**	**Lherzolite**	**Lherzolite**	**Lherzolite**	**Low-Cr garnets**
Li	NA	NA	NA	NA	NA
Be	NA	NA	NA	NA	NA
B	NA	NA	NA	NA	NA
Na	NA	NA	NA	NA	NA
Mg	NA	NA	NA	NA	NA
Al	NA	NA	NA	NA	NA
Si	NA	NA	NA	NA	NA
P	NA	NA	NA	NA	NA
K	NA	NA	NA	NA	NA
Ca	NA	NA	NA	NA	NA
Sc	60.3	1.410	62.8	82.9	71.4
Ti	4540	1980	4320	6360	4290
V	194.8	17.10	220	270	191.8
Cr	10160	158.0	12050	32500	8190
Mn	1741	21.6	1746	2050	2170
Fe	NA	NA	NA	NA	NA
Co	45.6	1.190	44.7	42.7	49.6
Ni	133.0	3.92	133.9	114.2	91.1
Cu	NA	NA	NA	NA	NA
Zn	NA	NA	NA	NA	NA
Ga	10.66	1.034	10.84	11.30	10.58
Rb	bdl	7.32	bdl	bdl	bdl
Sr	0.497	54.3	0.450	0.674	0.401
Y	12.58	1.689	12.21	17.30	16.22
Zr	41.5	51.9	31.1	70.5	45.3
Nb	0.228	26.7	0.285	0.211	0.1140
Cs	bdl	0.1140	bdl	bdl	bdl
Ba	bdl	24.2	bdl	bdl	bdl
La	bdl	1.714	bdl	bdl	bdl
Ce	0.334	3.04	0.305	0.484	0.224
Pr	0.0930	0.363	0.1010	0.1200	0.0820
Nd	0.901	1.550	0.816	1.410	0.722
Sm	0.700	0.301	0.603	1.240	0.639
Eu	0.376	bdl	0.285	0.628	0.346
Gd	1.250	0.207	1.190	2.80	1.350
Tb	0.252	bdl	0.267	0.470	0.319
Dy	1.960	0.236	1.950	3.56	2.64
Ho	0.495	0.0444	0.460	0.749	0.640
Er	1.470	0.1460	1.500	2.08	2.09
Tm	0.231	bdl	0.240	0.295	0.322
Yb	1.710	0.1580	1.630	1.980	2.26
Lu	0.246	bdl	0.236	0.254	0.335
Hf	0.929	1.283	0.725	1.810	1.083
Ta	bdl	2.83	0.01960	bdl	bdl
Pb	NA	NA	NA	NA	NA
Th	NA	NA	NA	NA	NA
U	NA	NA	NA	NA	NA

CHAPTER 9.
EVOLUTION OF INDICATOR MINERALS: APPLICATIONS TO DIAMOND EXPLORATION

APPENDIX

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	35_d_042	35_f_049	35_h_055	35_h_056	35_a_034	35_a_035	35_b_036	35_c_039	35_c_040
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
compositional group	1	1	1	1	1	1	1	1	1
Texture	granulite	granulite	granulite	granulite	granulite	granulite	granulite	granulite	granulite
extra info	xenolith	xenolith	xenolith	xenolith	xenolith	xenolith	xenolith	xenolith	xenolith
analysed area	core	core	core	core	core	core	core	core	core
SiO_2	0.01	0.00	0.04	0.00	0.00	0.02	0.03	0.03	0.01
TiO_2	43.45	44.15	43.38	43.50	45.47	45.01	43.47	30.63	43.44
Al_2O_3	0.13	0.16	0.10	0.14	0.26	0.27	0.09	0.25	0.10
Nb_2O_5	0.00	0.02	0.00	0.02	0.09	0.00	0.00	0.13	0.11
ZrO_2	0.11	0.14	0.00	0.10	0.08	0.00	0.00	0.02	0.14
Cr_2O_3	0.18	0.11	0.26	0.20	0.21	0.18	0.22	0.70	0.21
Fe_2O_3	17.88	17.76	18.60	18.58	15.58	16.22	18.41	39.33	17.95
FeO	36.49	36.31	36.09	36.21	36.32	35.77	36.68	26.78	37.29
MnO	0.08	0.16	0.08	0.06	0.21	0.22	0.07	0.08	0.28
MgO	1.33	1.76	1.50	1.53	2.36	2.41	1.24	0.42	0.95
CaO	0.00	0.00	0.00	0.00	0.03	0.02	0.00	0.00	0.00
ZnO	0.17	0.14	0.13	0.13	0.16	0.07	0.11	0.07	0.02
V_2O_3	0.00	0.00	0.04	0.00	0.14	0.00	0.00	1.65	0.00
NiO	0.07	0.09	0.12	0.10	0.13	0.14	0.09	0.07	0.01
sum	99.90	100.80	100.33	100.57	101.04	100.34	100.40	100.16	100.51
Si	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000
Ti	0.787	0.800	0.786	0.788	0.824	0.815	0.787	0.555	0.787
Al	0.004	0.005	0.003	0.004	0.007	0.008	0.003	0.007	0.003
Nb	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001
Zr	0.001	0.002	0.000	0.001	0.001	0.000	0.000	0.000	0.002
Cr	0.003	0.002	0.005	0.004	0.004	0.003	0.004	0.013	0.004
Fe^{3+}	0.324	0.322	0.337	0.337	0.282	0.294	0.334	0.712	0.325
Fe^{2+}	0.735	0.731	0.727	0.729	0.731	0.720	0.738	0.539	0.751
Mn	0.002	0.003	0.002	0.001	0.004	0.004	0.001	0.002	0.006
Mg	0.048	0.063	0.054	0.055	0.085	0.086	0.045	0.015	0.034
Ca	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000
Zn	0.003	0.002	0.002	0.002	0.003	0.001	0.002	0.001	0.000
V	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.016	0.000
Ni	0.001	0.002	0.002	0.002	0.003	0.003	0.002	0.001	0.000
% geikielite	5.0	6.6	5.7	5.8	8.8	9.0	4.7	1.7	3.6
% hematites	17.1	16.8	17.7	17.7	14.7	15.3	17.5	39.1	17.1
% ilmenite	77.7	76.3	76.4	76.5	76.1	75.2	77.6	59.1	78.8
% pirofanite	0.2	0.3	0.2	0.1	0.4	0.5	0.2	0.2	0.6

Abbreviations: Compositional groups: **1.** Ilmenite sensu strictu; **2.** Fe^{3+}-rich ilmenite; **3.** Mg-rich ilmenite and **4.** Mn-rich ilmenite**.** Textures: **met.1** = metasomatic ilmenite (with apatite, clinopyroxene and amphibole); **met.2** = metasomatic ilmenite (veinlets in peridotites); **exsol** = ilmenite with hematite exsolutions; **sympl** = symplectitic ilmenite; **Mg-rich** = Mg enrichment in ilmenites,usually already rich in Mg (darker areas in BSE images); **recrist.** = ilmenite nodules showing recristallisation; **with Chr** = ilmenite nodules surrounding chromite and with inclusions

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	35_c_041	27_a_142	27_a_143	27_b_150	27_b_151	27_b_152	27_c_160	27_d_163	27_d_164
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
compositional group	1	1	1	1	1	1	1	1	1
Texture	granulite	met. 1	met. 1	met. 1	met. 1	met. 1	met. 1	met. 1	met. 1
extra info	xenolith	xenolith	xenolith	xenolith	xenolith	xenolith	xenolith	xenolith	xenolith
analysed area	core	core	core	core	core	core	core	core	core
SiO_2	0.01	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00
TiO_2	43.60	43.98	43.71	44.19	43.33	44.10	44.10	44.21	44.19
Al_2O_3	0.09	0.16	0.19	0.16	0.14	0.16	0.20	0.21	0.13
Nb_2O_5	0.10	0.00	0.00	0.00	0.00	0.11	0.04	0.01	0.03
ZrO_2	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr_2O_3	0.18	0.26	0.24	0.17	0.18	0.15	0.19	0.21	0.18
Fe_2O_3	17.13	16.11	17.12	16.89	18.88	17.10	16.17	16.51	16.43
FeO	37.63	37.38	36.91	37.43	36.72	37.37	36.74	36.83	37.29
MnO	0.27	0.12	0.31	0.20	0.28	0.29	0.29	0.18	0.20
MgO	0.78	1.13	1.13	1.16	1.02	1.16	1.35	1.45	1.21
CaO	0.00	0.00	0.07	0.01	0.03	0.00	0.12	0.00	0.01
ZnO	0.05	0.01	0.06	0.00	0.04	0.00	0.09	0.12	0.07
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.00	0.09	0.09	0.04	0.09	0.06	0.04	0.08	0.06
sum	99.85	99.32	99.95	100.25	100.70	100.50	99.33	99.81	99.81
Si	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000
Ti	0.790	0.797	0.792	0.800	0.785	0.799	0.799	0.801	0.800
Al	0.003	0.005	0.005	0.005	0.004	0.005	0.006	0.006	0.004
Nb	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
Zr	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cr	0.003	0.005	0.005	0.003	0.003	0.003	0.004	0.004	0.003
Fe^{3+}	0.310	0.292	0.310	0.306	0.342	0.310	0.293	0.299	0.298
Fe^{2+}	0.758	0.753	0.743	0.754	0.739	0.752	0.740	0.742	0.751
Mn	0.006	0.002	0.006	0.004	0.006	0.006	0.006	0.004	0.004
Mg	0.028	0.041	0.041	0.042	0.037	0.042	0.048	0.052	0.043
Ca	0.000	0.000	0.002	0.000	0.001	0.000	0.003	0.000	0.000
Zn	0.001	0.000	0.001	0.000	0.001	0.000	0.002	0.002	0.001
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.000	0.002	0.002	0.001	0.002	0.001	0.001	0.002	0.001
% geikielite	3.0	4.3	4.3	4.4	3.8	4.4	5.2	5.5	4.6
% hematites	16.4	15.5	16.4	16.1	17.9	16.2	15.6	15.8	15.7
% ilmenite	80.1	79.9	78.6	79.1	77.6	78.8	78.6	78.3	79.3
% pirofanite	0.6	0.3	0.7	0.4	0.6	0.6	0.6	0.4	0.4

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	27_e_170	27_e_171	27_j_180	42_a_149	42_a_150	42_b_155	42_b_156	32A_b_073	32A_b_074
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
compositional group	1	1	1	1	1	1	1	2	2
Texture	met. 1	met. 1	met. 1	met. 1	met. 1	met. 1	met. 1	exsol	exsol
extra info	xenolith	xenolith	xenolith	xenolith	xenolith	xenolith	xenolith	partially altered	partially altered
analysed area	core	core	core	core	core	core	core	core	core
SiO_2	0.00	0.02	0.00	0.08	0.00	0.05	0.04	0.00	0.07
TiO_2	43.71	44.02	45.84	43.73	42.58	44.59	44.77	37.29	36.76
Al_2O_3	0.11	0.20	0.10	0.11	0.15	0.14	0.12	0.29	0.35
Nb_2O_5	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.34	0.16
ZrO_2	0.12	0.00	0.03	0.08	0.07	0.00	0.00	0.46	0.13
Cr_2O_3	0.20	0.21	0.18	0.91	1.17	0.94	0.96	1.11	1.13
Fe_2O_3	17.04	16.26	11.00	17.92	19.80	15.55	15.54	29.32	30.90
FeO	35.84	35.19	37.60	35.44	34.67	35.58	36.32	26.88	25.74
MnO	0.31	0.87	0.33	0.26	0.27	0.27	0.28	0.17	0.11
MgO	1.76	1.89	1.81	2.00	1.77	2.35	2.07	4.00	4.22
CaO	0.03	0.01	0.03	0.00	0.02	0.01	0.00	0.00	0.00
ZnO	0.07	0.12	0.04	0.19	0.07	0.06	0.05	0.00	0.01
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.00	0.07	0.02	0.05	0.16	0.07	0.05	0.00	0.02
sum	99.19	98.86	96.98	100.77	100.73	99.61	100.26	99.86	99.60
Si	0.000	0.000	0.000	0.002	0.000	0.001	0.001	0.000	0.002
Ti	0.792	0.797	0.830	0.792	0.771	0.808	0.811	0.675	0.666
Al	0.003	0.006	0.003	0.003	0.004	0.004	0.003	0.008	0.010
Nb	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.004	0.002
Zr	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.005	0.002
Cr	0.004	0.004	0.003	0.017	0.022	0.018	0.018	0.021	0.022
Fe^{3+}	0.309	0.295	0.199	0.325	0.359	0.282	0.281	0.531	0.560
Fe^{2+}	0.722	0.708	0.757	0.713	0.698	0.716	0.731	0.541	0.518
Mn	0.006	0.018	0.007	0.005	0.006	0.006	0.006	0.003	0.002
Mg	0.063	0.068	0.065	0.072	0.064	0.084	0.074	0.144	0.151
Ca	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000
Zn	0.001	0.002	0.001	0.003	0.001	0.001	0.001	0.000	0.000
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.000	0.001	0.000	0.001	0.003	0.001	0.001	0.000	0.000
% geikielite	6.7	7.2	7.0	7.5	6.7	8.9	7.8	15.1	15.9
% hematites	16.3	15.6	10.7	17.0	18.9	14.9	14.8	27.8	29.4
% ilmenite	76.3	75.3	81.5	74.9	73.8	75.6	76.8	56.7	54.4
% pirofanite	0.7	1.9	0.7	0.6	0.6	0.6	0.6	0.4	0.2

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	32A_b_075	42_h_168	42_h_169	37_i_028	26_f_017	26_f_018	32A_i_090	32A_i_090	42_f_166
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
compositional group	2	2	2	2	2	2	2	2	2
Texture	exsol	exsol	exsol	exsol	exsol	exsol	exsol	exsol	exsol
extra info	partially altered								
analysed area	core	core	rim	core	core	core	core	core	core
SiO_2	0.01	0.03	0.06	0.21	0.04	0.00	0.05	0.07	0.06
TiO_2	37.57	38.14	38.68	36.47	47.21	45.65	35.95	35.83	34.41
Al_2O_3	0.31	0.37	0.37	0.11	0.11	0.08	0.37	0.30	0.39
Nb_2O_5	0.30	0.26	0.45	0.62	0.99	0.86	0.52	0.44	0.24
ZrO_2	0.19	0.13	0.28	0.55	0.60	0.80	0.43	0.27	0.31
Cr_2O_3	1.12	1.40	1.31	0.37	0.46	0.57	0.96	0.93	1.22
Fe_2O_3	29.75	28.49	27.37	30.14	13.03	14.09	32.03	31.07	34.37
FeO	26.87	26.33	26.62	29.26	30.90	33.83	25.26	26.52	24.84
MnO	0.10	0.14	0.28	0.09	0.23	0.22	0.15	0.10	0.12
MgO	4.06	4.55	4.72	2.61	7.11	4.66	4.36	3.51	3.62
CaO	0.00	0.00	0.01	0.01	0.07	0.03	0.00	0.00	0.00
ZnO	0.03	0.07	0.07	0.04	0.04	0.07	0.03	0.08	0.00
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.01	0.06	0.13	0.00	0.00	0.00	0.00	0.00	0.05
sum	100.32	99.97	100.35	100.48	100.80	100.86	100.11	99.12	99.63
Si	0.000	0.001	0.001	0.005	0.001	0.000	0.001	0.002	0.001
Ti	0.680	0.691	0.701	0.661	0.855	0.827	0.651	0.649	0.623
Al	0.009	0.010	0.010	0.003	0.003	0.002	0.010	0.009	0.011
Nb	0.003	0.003	0.005	0.007	0.011	0.009	0.006	0.005	0.003
Zr	0.002	0.002	0.003	0.006	0.007	0.009	0.005	0.003	0.004
Cr	0.021	0.027	0.025	0.007	0.009	0.011	0.018	0.018	0.023
Fe^{3+}	0.539	0.516	0.496	0.546	0.236	0.255	0.580	0.563	0.623
Fe^{2+}	0.541	0.530	0.536	0.589	0.622	0.681	0.509	0.534	0.500
Mn	0.002	0.003	0.006	0.002	0.005	0.004	0.003	0.002	0.002
Mg	0.146	0.163	0.169	0.094	0.255	0.167	0.156	0.126	0.130
Ca	0.000	0.000	0.000	0.000	0.002	0.001	0.000	0.000	0.000
Zn	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.000	0.001	0.003	0.000	0.000	0.000	0.000	0.000	0.001
% geikielite	15.2	17.1	17.7	9.8	25.5	17.1	16.3	13.4	13.8
% hematites	28.1	27.0	25.9	28.5	11.8	13.0	30.3	29.8	33.0
% ilmenite	56.5	55.5	55.9	61.5	62.2	69.5	53.1	56.6	53.0
% pirofanite	0.2	0.3	0.6	0.2	0.5	0.5	0.3	0.2	0.3

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	6A(2)_a_079	6A(2)_a_082	6A(2)_a_084	6A(2)_d_094	6A(2)_d_095	6A(2)_z4_113	6A(2)_z4_114	6A_a_031	6A_a_032
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
compositional group	2	2	2	2	2	2	2	2	2
Texture	exsol	exsol	exsol	exsol	exsol	exsol	exsol	exsol	exsol
extra info									
analysed area	rim	rim	core	core	core	core	core	core	core
SiO_2	0.06	0.02	0.00	0.00	0.00	0.08	0.04	0.00	0.00
TiO_2	49.83	45.77	43.40	35.89	37.16	44.10	45.82	36.61	35.77
Al_2O_3	0.75	0.12	0.17	0.14	0.13	0.24	0.32	0.25	0.27
Nb_2O_5	0.12	0.77	0.53	0.46	0.44	0.79	0.78	0.49	0.18
ZrO_2	0.02	0.50	0.40	0.55	0.41	0.77	0.61	0.17	0.28
Cr_2O_3	3.74	0.53	0.49	0.39	0.41	0.17	0.19	0.73	0.81
Fe_2O_3	6.89	16.16	19.44	30.49	30.06	21.65	18.03	30.36	32.49
FeO	27.04	30.58	31.01	28.51	28.52	26.55	21.75	27.58	26.71
MnO	1.05	0.10	0.20	0.11	0.12	0.36	0.37	0.10	0.05
MgO	9.33	6.50	4.80	2.45	3.03	7.89	11.27	3.28	3.19
CaO	0.14	0.00	0.00	0.01	0.00	0.07	0.12	0.00	0.00
ZnO	0.01	0.06	0.04	0.02	0.11	0.00	0.03	0.00	0.04
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.12	0.00	0.05	0.09	0.00	0.00	0.07	0.04	0.06
sum	99.10	101.11	100.53	99.10	100.39	102.67	99.41	99.60	99.85
Si	0.001	0.000	0.000	0.000	0.000	0.002	0.001	0.000	0.000
Ti	0.903	0.829	0.786	0.650	0.673	0.799	0.830	0.663	0.648
Al	0.021	0.003	0.005	0.004	0.004	0.007	0.009	0.007	0.008
Nb	0.001	0.008	0.006	0.005	0.005	0.009	0.008	0.005	0.002
Zr	0.000	0.006	0.005	0.006	0.005	0.009	0.007	0.002	0.003
Cr	0.071	0.010	0.009	0.007	0.008	0.003	0.004	0.014	0.015
Fe^{3+}	0.125	0.293	0.352	0.552	0.545	0.392	0.327	0.550	0.589
Fe^{2+}	0.544	0.616	0.624	0.574	0.574	0.535	0.438	0.555	0.538
Mn	0.021	0.002	0.004	0.002	0.002	0.007	0.008	0.002	0.001
Mg	0.335	0.233	0.172	0.088	0.109	0.283	0.404	0.118	0.114
Ca	0.004	0.000	0.000	0.000	0.000	0.002	0.003	0.000	0.000
Zn	0.000	0.001	0.001	0.000	0.002	0.000	0.001	0.000	0.001
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.002	0.000	0.001	0.002	0.000	0.000	0.001	0.001	0.001
% geikielite	34.8	23.4	17.6	9.4	11.4	27.7	39.9	12.4	12.1
% hematites	6.5	14.7	18.0	29.4	28.4	19.2	16.1	28.9	31.1
% ilmenite	56.5	61.7	63.9	61.0	60.0	52.3	43.2	58.4	56.7
% pirofanite	2.2	0.2	0.4	0.2	0.3	0.7	0.7	0.2	0.1

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	6A_a_033	6A_d_053	6A_d_054	6A_i_071	618-267a_c_143	618-267a_c_144	42_f_167	37_i_029	37_i_026
Kimberlite	Cat115	Cat115	Cat115	Cat115	Tchiuzo	Tchiuzo	Cat115	Cat115	Cat115
compositional group	2	2	2	2	2	2	2	2	2
Texture	exsol	exsol	exsol	exsol	exsol	exsol	exsol	exsol	exsol
extra info									homogeneous area
analysed area	core	core	core	core	core	core	core	core	core
SiO_2	0.02	0.02	0.00	0.07	0.04	0.05	0.00	0.11	0.10
TiO_2	36.39	47.25	50.52	36.99	52.60	50.74	35.99	30.09	30.94
Al_2O_3	0.27	0.16	0.21	0.32	0.56	0.58	0.74	0.24	0.22
Nb_2O_5	0.42	0.78	1.10	0.25	0.08	0.59	0.10	0.38	0.42
ZrO_2	0.41	0.70	0.67	0.20	0.04	0.33	0.33	0.21	0.32
Cr_2O_3	0.74	0.21	0.25	1.05	3.77	2.87	1.31	0.42	0.46
Fe_2O_3	31.89	17.37	11.80	31.25	7.09	10.00	34.00	45.68	41.51
FeO	27.34	23.40	21.48	26.24	21.54	20.52	19.89	22.27	23.69
MnO	0.08	0.33	0.44	0.20	0.37	0.44	0.19	0.14	0.08
MgO	3.33	11.10	13.94	4.07	14.19	14.19	7.00	2.94	2.63
CaO	0.00	0.12	0.14	0.01	0.13	0.15	0.00	0.00	0.07
ZnO	0.08	0.10	0.01	0.00	0.01	0.01	0.00	0.05	0.00
V_2O_3	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00
NiO	0.03	0.02	0.07	0.04	0.09	0.08	0.12	0.04	0.05
sum	101.00	101.56	100.62	100.78	100.51	100.54	99.67	102.57	100.49
Si	0.000	0.000	0.000	0.002	0.001	0.001	0.000	0.003	0.002
Ti	0.659	0.856	0.915	0.670	0.953	0.919	0.652	0.545	0.560
Al	0.008	0.005	0.006	0.009	0.016	0.016	0.021	0.007	0.006
Nb	0.005	0.008	0.012	0.003	0.001	0.006	0.001	0.004	0.005
Zr	0.005	0.008	0.008	0.002	0.000	0.004	0.004	0.002	0.004
Cr	0.014	0.004	0.005	0.020	0.072	0.055	0.025	0.008	0.009
Fe^{3+}	0.578	0.315	0.214	0.566	0.128	0.181	0.616	0.828	0.752
Fe^{2+}	0.550	0.471	0.432	0.528	0.434	0.413	0.400	0.448	0.477
Mn	0.002	0.007	0.009	0.004	0.008	0.009	0.004	0.003	0.002
Mg	0.120	0.398	0.500	0.146	0.509	0.509	0.251	0.106	0.094
Ca	0.000	0.003	0.004	0.000	0.003	0.004	0.000	0.000	0.002
Zn	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.001	0.000
V	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
Ni	0.001	0.000	0.001	0.001	0.002	0.002	0.002	0.001	0.001
% geikielite	12.4	38.5	47.7	15.2	50.2	49.8	26.1	10.9	9.9
% hematites	30.1	15.2	10.2	29.4	6.3	8.9	32.0	42.6	39.6
% ilmenite	57.3	45.6	41.2	54.9	42.7	40.4	41.6	46.2	50.3
% pirofanite	0.2	0.7	0.9	0.4	0.7	0.9	0.4	0.3	0.2

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	6A_d_055	6A_d_056	6A(2)_z2_105	50_2a_106	50_2a_107	50_2a_108	50_2b_109	6A_h_067	6A_h_068
Kimberlite	Cat115	Cat115	Cat115	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Cat115	Cat115
compositional group	2	2	2	2	2	2	2	2	2
Texture	exsol	exsol	exsol	nodule	nodule	nodule	nodule	nodule	nodule
extra info	homogeneous area	homogeneous area	homogeneous area	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered
analysed area	core	rim	core	core	core	rim	rim	core	rim
SiO_2	0.04	0.04	0.05	0.02	0.00	0.00	0.02	0.03	0.00
TiO_2	31.69	32.06	34.35	40.80	40.76	40.82	40.93	38.37	38.55
Al_2O_3	0.29	0.28	0.31	0.39	0.37	0.44	0.40	0.39	0.43
Nb_2O_5	0.51	0.31	0.39	0.16	0.27	0.18	0.35	0.27	0.58
ZrO_2	0.21	0.09	0.25	0.11	0.08	0.06	0.13	0.24	0.08
Cr_2O_3	0.53	0.57	1.09	0.41	0.42	0.43	0.41	1.33	1.29
Fe_2O_3	40.55	40.32	35.71	24.56	24.52	24.33	24.35	28.42	28.93
FeO	24.00	23.86	25.01	27.54	27.24	27.65	27.06	26.72	26.62
MnO	0.05	0.09	0.12	0.22	0.25	0.26	0.20	0.17	0.22
MgO	2.81	2.94	3.54	5.12	5.24	5.03	5.56	4.50	4.70
CaO	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00
ZnO	0.11	0.07	0.04	0.00	0.15	0.05	0.05	0.02	0.06
V_2O_3	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.08	0.02	0.05	0.08	0.01	0.03	0.08	0.06	0.08
sum	100.86	100.65	100.96	99.41	99.34	99.28	99.54	100.52	101.54
Si	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.000
Ti	0.574	0.581	0.622	0.739	0.738	0.739	0.741	0.695	0.698
Al	0.008	0.008	0.009	0.011	0.010	0.012	0.011	0.011	0.012
Nb	0.006	0.003	0.004	0.002	0.003	0.002	0.004	0.003	0.006
Zr	0.002	0.001	0.003	0.001	0.001	0.001	0.002	0.003	0.001
Cr	0.010	0.011	0.021	0.008	0.008	0.008	0.008	0.025	0.025
Fe^{3+}	0.735	0.730	0.647	0.445	0.444	0.441	0.441	0.515	0.524
Fe^{2+}	0.483	0.480	0.504	0.554	0.549	0.557	0.545	0.538	0.536
Mn	0.001	0.002	0.002	0.004	0.005	0.005	0.004	0.003	0.004
Mg	0.101	0.106	0.127	0.184	0.188	0.181	0.200	0.162	0.169
Ca	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000
Zn	0.002	0.001	0.001	0.000	0.003	0.001	0.001	0.000	0.001
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.002	0.000	0.001	0.002	0.000	0.001	0.002	0.001	0.002
% geikielite	10.6	11.1	13.3	19.0	19.5	18.7	20.6	16.8	17.4
% hematites	38.6	38.3	33.8	23.1	23.0	22.9	22.8	26.8	27.0
% ilmenite	50.7	50.4	52.6	57.4	56.9	57.8	56.2	56.0	55.2
% pirofanite	0.1	0.2	0.3	0.5	0.5	0.6	0.4	0.4	0.5

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	618-47_g_110	32A_g_087	32A_g_088	32A_g_089	60A_2a_037	60A_2b_041	60B_1c_077	60B_1d_078	60B_1e_079
Kimberlite	Tchiuzo	Cat115	Cat115	Cat115	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
compositional group	2	2	2	2	2	2	2	2	2
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info	partially altered								
analysed area	core	rim	core	rim	core	rim	core	core	core
SiO_2	0.00	0.04	0.03	0.05	0.22	0.18	0.26	0.15	0.28
TiO_2	40.99	36.46	36.77	36.45	42.84	43.01	33.39	35.17	36.30
Al_2O_3	0.34	0.21	0.18	0.20	0.30	0.36	0.40	0.69	0.93
Nb_2O_5	0.33	0.28	0.25	0.36	0.48	0.46	0.40	0.34	0.20
ZrO_2	0.16	0.27	0.30	0.26	0.16	0.22	0.24	0.12	0.17
Cr_2O_3	1.17	1.36	1.35	1.33	0.97	0.99	4.43	4.63	4.69
Fe_2O_3	23.32	29.82	30.70	30.24	20.99	21.16	32.72	30.65	28.11
FeO	27.10	25.68	25.95	25.73	27.83	27.87	24.25	23.02	22.69
MnO	0.19	0.20	0.18	0.16	0.27	0.26	0.08	0.05	0.11
MgO	5.61	4.13	4.15	4.12	6.30	6.36	3.63	5.09	5.81
CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ZnO	0.01	0.01	0.00	0.09	0.00	0.01	0.03	0.07	0.00
V_2O_3	0.00	0.00	0.00	0.00	0.04	0.00	0.11	0.13	0.15
NiO	0.02	0.06	0.03	0.08	0.08	0.05	0.10	0.05	0.15
sum	99.25	98.52	99.89	99.07	100.48	100.93	100.04	100.16	99.60
Si	0.000	0.001	0.001	0.001	0.005	0.004	0.006	0.004	0.007
Ti	0.742	0.660	0.666	0.660	0.776	0.779	0.605	0.637	0.657
Al	0.010	0.006	0.005	0.006	0.009	0.010	0.011	0.020	0.026
Nb	0.004	0.003	0.003	0.004	0.005	0.005	0.004	0.004	0.002
Zr	0.002	0.003	0.004	0.003	0.002	0.003	0.003	0.001	0.002
Cr	0.022	0.026	0.026	0.025	0.018	0.019	0.084	0.088	0.089
Fe^{3+}	0.423	0.540	0.556	0.548	0.380	0.383	0.593	0.555	0.509
Fe^{2+}	0.546	0.517	0.522	0.518	0.560	0.561	0.488	0.464	0.457
Mn	0.004	0.004	0.004	0.003	0.006	0.005	0.002	0.001	0.002
Mg	0.201	0.148	0.149	0.148	0.226	0.228	0.130	0.183	0.209
Ca	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zn	0.000	0.000	0.000	0.002	0.000	0.000	0.001	0.001	0.000
V	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001
Ni	0.000	0.001	0.001	0.002	0.002	0.001	0.002	0.001	0.003
% geikielite	20.9	15.8	15.6	15.7	23.0	23.1	14.2	19.8	22.6
% hematites	22.0	28.8	29.2	29.0	19.4	19.4	32.3	30.0	27.6
% ilmenite	56.7	55.0	54.8	54.9	57.1	56.9	53.3	50.1	49.5
% pirofanite	0.4	0.4	0.4	0.3	0.6	0.5	0.2	0.1	0.2

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	60B_1e_080	60B_1h_083	60B_1i_084	60B_2a_085	618-47_c_093	618-47_c_094	40A_b_127	40A_b_128	40A_b_129
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Cat115	Cat115	Cat115
compositional group	2	2	2	2	2	2	2	2	2
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info									
analysed area	core	core	core	core	core	core	core	core	core
SiO_2	0.30	0.31	0.12	0.15	0.01	0.02	0.10	0.04	0.03
TiO_2	35.65	41.12	37.27	41.72	42.09	41.91	41.67	41.59	41.06
Al_2O_3	0.58	1.11	0.83	0.33	0.42	0.35	0.42	0.44	0.44
Nb_2O_5	0.34	0.37	0.56	0.57	0.19	0.29	0.38	0.17	0.49
ZrO_2	0.29	0.21	0.11	0.00	0.08	0.06	0.23	0.34	0.07
Cr_2O_3	4.54	3.33	4.78	1.31	0.99	1.00	1.32	1.29	1.35
Fe_2O_3	28.97	21.50	25.52	21.58	21.81	21.77	22.07	22.90	23.16
FeO	24.19	24.07	24.01	28.01	27.38	27.07	27.68	27.53	26.81
MnO	0.05	0.14	0.07	0.23	0.29	0.20	0.25	0.14	0.28
MgO	4.78	7.52	5.69	5.61	5.82	5.99	5.68	5.62	5.80
CaO	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00
ZnO	0.04	0.09	0.00	0.00	0.02	0.04	0.00	0.09	0.00
V_2O_3	0.17	0.06	0.28	0.04	0.00	0.00	0.00	0.00	0.00
NiO	0.18	0.18	0.12	0.09	0.06	0.09	0.09	0.06	0.11
sum	100.07	100.02	99.36	99.63	99.17	98.79	99.89	100.22	99.60
Si	0.007	0.007	0.003	0.004	0.000	0.000	0.002	0.001	0.001
Ti	0.646	0.745	0.675	0.756	0.762	0.759	0.755	0.753	0.744
Al	0.016	0.031	0.024	0.009	0.012	0.010	0.012	0.012	0.012
Nb	0.004	0.004	0.006	0.006	0.002	0.003	0.004	0.002	0.005
Zr	0.003	0.002	0.001	0.000	0.001	0.001	0.003	0.004	0.001
Cr	0.086	0.063	0.091	0.025	0.019	0.019	0.025	0.025	0.026
Fe^{3+}	0.525	0.390	0.462	0.391	0.395	0.394	0.400	0.415	0.420
Fe^{2+}	0.487	0.485	0.483	0.564	0.551	0.545	0.557	0.554	0.540
Mn	0.001	0.003	0.001	0.005	0.006	0.004	0.005	0.003	0.006
Mg	0.172	0.270	0.204	0.201	0.209	0.215	0.204	0.202	0.208
Ca	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zn	0.001	0.002	0.000	0.000	0.000	0.001	0.000	0.002	0.000
V	0.002	0.001	0.003	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.003	0.003	0.002	0.002	0.001	0.002	0.002	0.001	0.002
% geikielite	18.6	28.3	22.2	20.9	21.7	22.4	21.1	20.9	21.6
% hematites	28.5	20.5	25.1	20.2	20.5	20.5	20.7	21.5	21.8
% ilmenite	52.8	50.9	52.5	58.4	57.2	56.7	57.7	57.4	56.0
% pirofanite	0.1	0.3	0.2	0.5	0.6	0.4	0.5	0.3	0.6

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	40A_b_130	60B_2a_086	44_d_132	44_d_133	44_a_121	44_a_122	44_a_123	44_b_124	44_b_125
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
compositional group	2	2	3	3	3	3	3	3	3
Texture	nodule	nodule	met. 2	met. 2	met. 2	met. 2	met. 2	met. 2	met. 2
extra info			xenolith	xenolith	xenolith	xenolith	xenolith	xenolith	xenolith
analysed area	core	core	core	core	core	core	core	core	core
SiO_2	0.04	0.27	0.02	0.02	0.05	0.11	0.05	0.08	0.03
TiO_2	41.33	41.52	47.50	47.10	47.27	49.98	47.06	47.00	47.08
Al_2O_3	0.50	0.34	0.52	0.51	0.54	0.69	0.51	0.48	0.52
Nb_2O_5	0.35	0.27	0.23	0.15	0.18	0.07	0.18	0.30	0.15
ZrO_2	0.25	0.16	0.00	0.25	0.12	0.02	0.00	0.13	0.22
Cr_2O_3	1.33	1.36	0.35	0.32	0.34	0.40	0.36	0.33	0.32
Fe_2O_3	23.27	21.64	14.28	14.31	14.30	4.29	14.80	14.66	14.70
FeO	27.09	27.69	28.71	28.92	29.00	30.62	28.57	29.16	29.12
MnO	0.16	0.27	0.43	0.29	0.21	0.68	0.26	0.27	0.27
MgO	5.73	5.63	7.68	7.49	7.62	7.69	7.62	7.42	7.41
CaO	0.02	0.02	0.04	0.01	0.02	0.04	0.01	0.01	0.02
ZnO	0.14	0.00	0.12	0.04	0.00	0.08	0.07	0.03	0.02
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.14	0.03	0.01	0.09	0.03	0.04	0.10	0.08	0.03
sum	100.35	99.21	99.89	99.50	99.67	94.71	99.59	99.95	99.89
Si	0.001	0.007	0.000	0.000	0.001	0.003	0.001	0.002	0.001
Ti	0.749	0.752	0.860	0.853	0.856	0.905	0.852	0.851	0.853
Al	0.014	0.010	0.015	0.014	0.015	0.020	0.014	0.014	0.015
Nb	0.004	0.003	0.003	0.002	0.002	0.001	0.002	0.003	0.002
Zr	0.003	0.002	0.000	0.003	0.001	0.000	0.000	0.002	0.003
Cr	0.025	0.026	0.007	0.006	0.006	0.008	0.007	0.006	0.006
Fe^{3+}	0.422	0.392	0.259	0.259	0.259	0.078	0.268	0.266	0.266
Fe^{2+}	0.545	0.558	0.578	0.582	0.584	0.617	0.575	0.587	0.586
Mn	0.003	0.006	0.009	0.006	0.004	0.014	0.005	0.006	0.006
Mg	0.206	0.202	0.276	0.269	0.273	0.276	0.273	0.266	0.266
Ca	0.001	0.001	0.001	0.000	0.001	0.001	0.000	0.000	0.001
Zn	0.002	0.000	0.002	0.001	0.000	0.001	0.001	0.001	0.000
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.003	0.001	0.000	0.002	0.001	0.001	0.002	0.002	0.001
% geikielite	21.3	21.0	27.8	27.2	27.6	29.2	27.7	26.9	26.8
% hematites	21.8	20.4	13.0	13.1	13.1	4.1	13.6	13.4	13.4
% ilmenite	56.5	58.0	58.3	59.0	58.9	65.2	58.2	59.2	59.2
% pirofanite	0.3	0.6	0.9	0.6	0.4	1.5	0.5	0.6	0.6

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	44_b_126	44_g_140	44_g_141	26_i_029	12_a_001	12_a_002	12_a_003	12_a_007	12_a_008
Kimberlite	Cat115	Cat115	Cat115	Cat115	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1
compositional group	3	3	3	3	3	3	3	3	3
Texture	met. 2	met. 2	met. 2	nodule	nodule	nodule	nodule	nodule	nodule
extra info	xenolith	xenolith	xenolith	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered
analysed area	core	core	core	core	core	core	core	core	med
SiO_2	0.04	0.03	0.02	0.01	0.00	0.00	0.00	0.06	0.03
TiO_2	47.12	46.63	46.28	47.32	51.89	51.96	52.15	50.37	50.51
Al_2O_3	0.51	0.60	0.55	0.64	0.54	0.52	0.54	0.62	0.66
Nb_2O_5	0.25	0.16	0.20	0.38	0.03	0.00	0.00	0.09	0.00
ZrO_2	0.10	0.09	0.10	0.02	0.00	0.03	0.03	0.07	0.00
Cr_2O_3	0.30	0.33	0.31	0.96	1.41	1.48	1.25	3.38	3.51
Fe_2O_3	14.31	14.52	15.42	14.78	8.43	7.42	7.98	7.73	7.49
FeO	29.43	28.90	28.33	27.99	27.85	27.76	27.92	27.59	27.44
MnO	0.28	0.22	0.31	0.24	0.34	0.39	0.33	0.34	0.35
MgO	7.24	7.28	7.37	8.20	10.29	10.32	10.40	9.78	9.85
CaO	0.01	0.01	0.01	0.02	0.04	0.06	0.00	0.02	0.01
ZnO	0.06	0.05	0.03	0.04	0.03	0.05	0.00	0.03	0.01
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.08	0.05	0.11	0.09	0.10	0.09	0.14	0.11	0.10
sum	99.73	98.87	99.05	100.69	100.96	100.08	100.74	100.18	99.96
Si	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.001
Ti	0.853	0.845	0.838	0.857	0.940	0.941	0.945	0.912	0.915
Al	0.014	0.017	0.016	0.018	0.015	0.015	0.015	0.018	0.019
Nb	0.003	0.002	0.002	0.004	0.000	0.000	0.000	0.001	0.000
Zr	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.000
Cr	0.006	0.006	0.006	0.018	0.027	0.028	0.024	0.064	0.067
Fe^{3+}	0.259	0.263	0.279	0.268	0.153	0.134	0.145	0.140	0.136
Fe^{2+}	0.593	0.582	0.570	0.564	0.561	0.559	0.562	0.555	0.553
Mn	0.006	0.004	0.006	0.005	0.007	0.008	0.007	0.007	0.007
Mg	0.260	0.261	0.265	0.294	0.369	0.370	0.373	0.351	0.354
Ca	0.000	0.000	0.000	0.001	0.001	0.002	0.000	0.001	0.000
Zn	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.000
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.002	0.001	0.002	0.002	0.002	0.002	0.003	0.002	0.002
% geikielite	26.3	26.7	27.0	29.5	36.4	36.9	36.8	35.7	36.0
% hematites	13.1	13.4	14.2	13.4	7.5	6.7	7.1	7.1	6.9
% ilmenite	60.0	59.4	58.2	56.6	55.3	55.6	55.4	56.5	56.3
% pirofanite	0.6	0.5	0.6	0.5	0.7	0.8	0.7	0.7	0.7

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	12_a_009	12_c_019	12_c_020	12_d_022	12_d_024	12_d_025	12_d_028	12_d_029	2_a_036
Kimberlite	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered
analysed area	rim	core	core	core	core	rim	core	rim	core
SiO_2	0.02	0.01	0.07	0.02	0.05	0.03	0.03	0.04	0.00
TiO_2	49.98	50.69	51.36	50.10	51.27	50.92	52.38	51.81	52.52
Al_2O_3	0.56	0.58	0.64	0.86	0.58	0.54	0.67	0.61	0.52
Nb_2O_5	0.15	0.20	0.26	0.04	0.08	0.07	0.06	0.03	0.06
ZrO_2	0.21	0.14	0.14	0.00	0.18	0.02	0.18	0.00	0.00
Cr_2O_3	3.45	2.12	2.19	3.33	2.48	2.23	2.71	2.73	2.26
Fe_2O_3	10.19	9.53	7.05	8.45	8.23	9.58	4.78	8.43	5.95
FeO	26.30	26.10	27.87	27.68	25.41	23.55	24.33	21.23	25.99
MnO	0.65	0.50	0.63	0.32	2.27	2.06	4.22	4.02	1.06
MgO	10.06	10.69	10.03	9.46	10.35	11.15	10.37	11.73	11.25
CaO	0.15	0.06	0.08	0.04	0.07	0.25	0.16	0.26	0.04
ZnO	0.00	0.12	0.00	0.08	0.00	0.09	0.00	0.04	0.09
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.19	0.07	0.17	0.15	0.13	0.02	0.03	0.11	0.06
sum	101.91	100.80	100.49	100.54	101.09	100.51	99.92	101.04	99.81
Si	0.000	0.000	0.002	0.000	0.001	0.001	0.001	0.001	0.000
Ti	0.905	0.918	0.930	0.907	0.929	0.922	0.949	0.938	0.951
Al	0.016	0.016	0.018	0.024	0.016	0.015	0.019	0.017	0.015
Nb	0.002	0.002	0.003	0.000	0.001	0.001	0.001	0.000	0.001
Zr	0.002	0.002	0.002	0.000	0.002	0.000	0.002	0.000	0.000
Cr	0.066	0.040	0.042	0.063	0.047	0.042	0.052	0.052	0.043
Fe^{3+}	0.185	0.173	0.128	0.153	0.149	0.174	0.087	0.153	0.108
Fe^{2+}	0.530	0.525	0.561	0.557	0.512	0.474	0.490	0.427	0.523
Mn	0.013	0.010	0.013	0.007	0.046	0.042	0.086	0.082	0.022
Mg	0.361	0.384	0.360	0.340	0.371	0.400	0.372	0.421	0.404
Ca	0.004	0.002	0.002	0.001	0.002	0.006	0.004	0.007	0.001
Zn	0.000	0.002	0.000	0.001	0.000	0.002	0.000	0.001	0.002
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.004	0.001	0.003	0.003	0.003	0.000	0.001	0.002	0.001
% geikielite	36.2	38.2	36.1	34.6	37.0	39.9	37.5	41.8	40.3
% hematites	9.3	8.6	6.4	7.8	7.4	8.7	4.4	7.6	5.4
% ilmenite	53.2	52.3	56.2	56.9	51.0	47.3	49.4	42.5	52.2
% pirofanite	1.3	1.0	1.3	0.7	4.6	4.2	8.7	8.1	2.2

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	2_a_037	2_a_038	2_b_040	2_b_041	2_c_044	2_c_045	2_d_048	2_d_049	2_d_050
Kimberlite	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered
analysed area	med	rim	core	rim	core	core	core	med	rim
SiO_2	0.04	0.03	0.05	0.00	0.02	0.00	0.04	0.01	0.01
TiO_2	52.51	50.78	53.15	52.35	52.55	52.02	52.32	51.77	51.81
Al_2O_3	0.57	0.55	0.37	0.47	0.61	0.57	0.56	0.58	0.68
Nb_2O_5	0.09	0.16	0.24	0.06	0.07	0.07	0.09	0.18	0.06
ZrO_2	0.04	0.12	0.06	0.14	0.26	0.14	0.00	0.00	0.06
Cr_2O_3	2.40	0.98	2.48	1.52	1.19	1.49	1.84	1.99	2.55
Fe_2O_3	7.00	7.42	3.80	4.42	8.77	9.22	6.90	6.74	6.20
FeO	24.90	27.12	22.87	24.21	23.62	23.00	27.41	27.83	27.85
MnO	1.36	2.44	0.64	0.61	0.51	0.47	0.29	0.28	0.32
MgO	11.75	9.12	13.71	12.46	13.03	13.06	10.84	10.42	10.34
CaO	0.04	0.08	0.07	0.07	0.03	0.02	0.02	0.03	0.03
ZnO	0.05	0.01	0.03	0.00	0.02	0.06	0.05	0.00	0.05
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.09	0.00	0.10	0.11	0.11	0.12	0.12	0.05	0.03
sum	100.84	98.81	97.57	96.42	100.79	100.24	100.48	99.89	99.99
Si	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.000	0.000
Ti	0.951	0.920	0.963	0.948	0.952	0.942	0.948	0.938	0.938
Al	0.016	0.016	0.010	0.013	0.017	0.016	0.016	0.016	0.019
Nb	0.001	0.002	0.003	0.001	0.001	0.001	0.001	0.002	0.001
Zr	0.000	0.001	0.001	0.002	0.003	0.002	0.000	0.000	0.001
Cr	0.046	0.019	0.047	0.029	0.023	0.028	0.035	0.038	0.049
Fe^{3+}	0.127	0.135	0.069	0.080	0.159	0.167	0.125	0.122	0.112
Fe^{2+}	0.501	0.546	0.460	0.488	0.476	0.463	0.552	0.560	0.561
Mn	0.028	0.050	0.013	0.012	0.010	0.010	0.006	0.006	0.007
Mg	0.422	0.327	0.492	0.447	0.468	0.469	0.389	0.374	0.371
Ca	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001
Zn	0.001	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.001
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.002	0.000	0.002	0.002	0.002	0.002	0.002	0.001	0.001
% geikielite	41.6	33.1	49.2	45.3	45.3	45.7	38.5	37.4	37.3
% hematites	6.3	6.8	3.4	4.1	7.7	8.1	6.2	6.1	5.6
% ilmenite	49.4	55.1	46.0	49.4	46.0	45.2	54.7	56.0	56.4
% pirofanite	2.7	5.0	1.3	1.3	1.0	0.9	0.6	0.6	0.7

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	2_e_053	2_e_054	31_c_080	31_c_081	31_d_084	31_d_085	34_b_011	34_b_012	34_b_013
Kimberlite	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Cat115	Cat115	Cat115	Cat115	Cat115
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered
analysed area	core	rim	core	rim	core	core	core	med	rim
SiO_2	0.05	0.00	0.00	0.04	0.07	0.05	0.02	0.00	0.05
TiO_2	52.22	52.07	47.88	47.66	53.18	52.50	44.81	44.40	44.66
Al_2O_3	0.56	0.54	0.57	0.56	0.66	0.64	0.45	0.45	0.49
Nb_2O_5	0.00	0.01	0.24	0.26	0.10	0.06	0.19	0.37	0.33
ZrO_2	0.04	0.13	0.20	0.01	0.22	0.02	0.10	0.05	0.04
Cr_2O_3	2.53	2.14	1.03	1.10	3.01	2.83	1.08	1.05	0.97
Fe_2O_3	7.12	8.32	14.07	14.20	5.39	6.28	18.40	18.77	17.57
FeO	25.17	24.28	27.80	27.77	23.69	22.74	28.33	28.03	28.69
MnO	0.55	0.67	0.29	0.31	0.23	0.26	0.25	0.20	0.22
MgO	11.90	12.20	8.49	8.38	13.41	13.48	6.67	6.80	6.49
CaO	0.03	0.06	0.02	0.00	0.10	0.10	0.00	0.01	0.00
ZnO	0.00	0.04	0.08	0.11	0.07	0.11	0.06	0.00	0.10
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.08	0.11	0.13	0.09	0.15	0.11	0.07	0.00	0.05
sum	100.25	100.57	100.80	100.49	100.28	99.18	100.43	100.13	99.66
Si	0.001	0.000	0.000	0.001	0.002	0.001	0.000	0.000	0.001
Ti	0.946	0.943	0.867	0.863	0.963	0.951	0.812	0.804	0.809
Al	0.016	0.015	0.016	0.016	0.019	0.018	0.013	0.013	0.014
Nb	0.000	0.000	0.003	0.003	0.001	0.001	0.002	0.004	0.004
Zr	0.000	0.002	0.002	0.000	0.003	0.000	0.001	0.001	0.000
Cr	0.048	0.041	0.020	0.021	0.057	0.054	0.021	0.020	0.018
Fe^{3+}	0.129	0.151	0.255	0.257	0.098	0.114	0.333	0.340	0.318
Fe^{2+}	0.507	0.489	0.560	0.559	0.477	0.458	0.570	0.564	0.578
Mn	0.011	0.014	0.006	0.006	0.005	0.005	0.005	0.004	0.004
Mg	0.427	0.438	0.305	0.301	0.481	0.484	0.239	0.244	0.233
Ca	0.001	0.002	0.001	0.000	0.003	0.003	0.000	0.000	0.000
Zn	0.000	0.001	0.001	0.002	0.001	0.002	0.001	0.000	0.002
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.002	0.002	0.003	0.002	0.003	0.002	0.001	0.000	0.001
% geikielite	42.3	43.1	30.5	30.2	47.6	48.2	24.4	24.8	23.9
% hematites	6.4	7.4	12.8	12.9	4.8	5.7	17.0	17.3	16.3
% ilmenite	50.2	48.1	56.1	56.2	47.1	45.6	58.1	57.4	59.3
% pirofanite	1.1	1.3	0.6	0.6	0.5	0.5	0.5	0.4	0.5

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	34_d_017	34_d_018	34_f_021	34_f_022	40A_f_138	40A_f_139	40A_g_142	40A_g_143	40A_g_144
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered
analysed area	core	core	core	core	core	core	core	med	rim
SiO_2	0.03	0.00	0.04	0.00	0.06	0.00	0.02	0.07	0.06
TiO_2	48.17	48.10	43.05	43.59	46.64	46.86	45.92	45.42	45.21
Al_2O_3	0.52	0.57	0.44	0.42	0.57	0.50	0.52	0.52	0.52
Nb_2O_5	0.22	0.12	0.26	0.33	0.35	0.22	0.15	0.37	0.45
ZrO_2	0.26	0.11	0.23	0.01	0.00	0.04	0.07	0.05	0.17
Cr_2O_3	0.95	0.98	0.98	0.96	0.87	0.84	0.85	0.88	0.80
Fe_2O_3	13.62	13.84	20.73	20.25	15.35	15.37	15.80	16.90	16.75
FeO	27.37	26.34	28.00	27.17	27.75	27.73	28.18	27.90	27.11
MnO	0.26	0.28	0.14	0.19	0.25	0.30	0.24	0.25	0.29
MgO	8.93	9.36	6.13	6.77	7.97	7.98	7.25	7.32	7.71
CaO	0.02	0.01	0.00	0.00	0.00	0.00	0.02	0.01	0.09
ZnO	0.06	0.03	0.00	0.06	0.01	0.04	0.01	0.05	0.03
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.13	0.12	0.13	0.09	0.19	0.13	0.16	0.12	0.04
sum	100.54	99.86	100.13	99.85	100.02	100.01	99.19	99.85	99.23
Si	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.002	0.001
Ti	0.872	0.871	0.780	0.790	0.845	0.849	0.832	0.823	0.819
Al	0.015	0.016	0.012	0.012	0.016	0.014	0.015	0.015	0.015
Nb	0.002	0.001	0.003	0.004	0.004	0.002	0.002	0.004	0.005
Zr	0.003	0.001	0.003	0.000	0.000	0.000	0.001	0.001	0.002
Cr	0.018	0.019	0.019	0.018	0.017	0.016	0.016	0.017	0.015
Fe^{3+}	0.247	0.251	0.376	0.367	0.278	0.279	0.286	0.306	0.303
Fe^{2+}	0.551	0.530	0.564	0.547	0.559	0.558	0.567	0.562	0.546
Mn	0.005	0.006	0.003	0.004	0.005	0.006	0.005	0.005	0.006
Mg	0.321	0.336	0.220	0.243	0.286	0.286	0.260	0.263	0.277
Ca	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.002
Zn	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.001
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.003	0.002	0.003	0.002	0.004	0.003	0.003	0.002	0.001
% geikielite	32.0	33.7	22.6	24.9	28.9	28.9	26.7	26.7	28.2
% hematites	12.3	12.6	19.3	18.8	14.1	14.1	14.7	15.6	15.5
% ilmenite	55.1	53.2	57.9	56.0	56.5	56.4	58.2	57.2	55.7
% pirofanite	0.5	0.6	0.3	0.4	0.5	0.6	0.5	0.5	0.6

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	6A(2)_z3_106	6A(2)_z5_117	6A(2)_z5_118	6A(2)_z5_119	6A_j_076	6A_j_078	6A_j_077	610-67.3a_b_136	610-67.3a_b_13
Kimberlite	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Cat115	Tchiuzo	Tchiuzo
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered
analysed area	core	core	core	rim	core	med	rim	rim	med
SiO_2	0.03	0.01	0.04	0.02	0.00	0.01	0.00	0.00	0.02
TiO_2	46.60	48.04	48.20	48.32	43.44	43.85	43.54	44.90	44.77
Al_2O_3	0.56	0.51	0.53	0.55	0.44	0.53	0.55	0.44	0.38
Nb_2O_5	0.37	0.33	0.29	0.30	0.29	0.29	0.40	0.12	0.43
ZrO_2	0.15	0.06	0.13	0.09	0.08	0.08	0.32	0.25	0.10
Cr_2O_3	0.86	0.68	0.70	0.65	1.30	1.28	1.32	0.75	0.76
Fe_2O_3	16.47	14.36	12.94	13.08	20.10	20.26	21.44	18.40	17.39
FeO	28.40	28.45	29.27	29.20	27.97	28.46	24.86	27.94	28.62
MnO	0.26	0.30	0.18	0.29	0.22	0.27	0.19	0.31	0.25
MgO	7.64	8.27	7.97	8.00	6.23	6.12	8.16	6.91	6.65
CaO	0.01	0.00	0.00	0.00	0.01	0.00	0.03	0.00	0.00
ZnO	0.09	0.03	0.08	0.00	0.13	0.05	0.05	0.02	0.05
V_2O_3	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.07	0.10	0.07	0.12	0.01	0.14	0.11	0.08	0.05
sum	101.52	101.14	100.40	100.62	100.22	101.34	100.97	100.12	99.47
Si	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Ti	0.844	0.870	0.873	0.875	0.787	0.794	0.789	0.813	0.811
Al	0.016	0.014	0.015	0.016	0.012	0.015	0.016	0.012	0.011
Nb	0.004	0.004	0.003	0.003	0.003	0.003	0.004	0.001	0.005
Zr	0.002	0.001	0.002	0.001	0.001	0.001	0.004	0.003	0.001
Cr	0.016	0.013	0.013	0.012	0.025	0.024	0.025	0.014	0.014
Fe^{3+}	0.298	0.260	0.234	0.237	0.364	0.367	0.388	0.333	0.315
Fe^{2+}	0.572	0.573	0.589	0.588	0.563	0.573	0.501	0.563	0.576
Mn	0.005	0.006	0.004	0.006	0.004	0.006	0.004	0.006	0.005
Mg	0.274	0.297	0.286	0.287	0.224	0.220	0.293	0.248	0.239
Ca	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
Zn	0.002	0.001	0.001	0.000	0.002	0.001	0.001	0.000	0.001
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.001	0.002	0.001	0.002	0.000	0.003	0.002	0.002	0.001
% geikielite	27.4	29.5	28.7	28.7	23.0	22.4	29.5	25.2	24.4
% hematites	14.9	12.9	11.8	11.9	18.7	18.7	19.6	16.9	16.1
% ilmenite	57.2	57.0	59.2	58.8	57.9	58.4	50.5	57.2	58.9
% pirofanite	0.5	0.6	0.4	0.6	0.5	0.6	0.4	0.6	0.5

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	510-67.3a_b_135	510-67.3a_b_136	618-267a_a_134	618-267a_a_136	618-267a_b_141	618-267a_b_137	618-267a_b_138	618-267a_b_139	618-267a_d_151
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered	partially altered
analysed area	core	core	core	core	rim2	rim	med	core	core
SiO_2	0.00	0.01	0.03	0.09	0.06	0.00	0.05	0.05	0.02
TiO_2	49.33	49.54	46.18	45.79	49.40	47.72	46.67	46.65	46.86
Al_2O_3	0.96	0.86	0.45	0.49	0.83	0.57	0.47	0.45	0.48
Nb_2O_5	0.25	0.27	0.27	0.26	0.25	0.30	0.18	0.29	0.11
ZrO_2	0.21	0.17	0.03	0.16	0.10	0.19	0.12	0.14	0.00
Cr_2O_3	0.88	0.81	0.66	0.67	1.31	0.51	0.51	0.50	0.52
Fe_2O_3	11.80	12.34	16.87	17.19	13.42	16.96	16.14	16.64	16.27
FeO	23.93	23.79	28.24	27.70	20.34	23.66	27.95	27.74	28.03
MnO	0.29	0.28	0.28	0.32	0.45	0.31	0.28	0.29	0.24
MgO	11.42	11.61	7.48	7.54	13.31	10.80	7.85	7.96	7.75
CaO	0.03	0.04	0.00	0.02	0.15	0.01	0.02	0.01	0.01
ZnO	0.06	0.08	0.03	0.18	0.00	0.05	0.04	0.10	0.11
V_2O_3	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.10	0.08	0.00	0.02	0.13	0.08	0.02	0.10	0.10
sum	99.26	99.91	100.52	100.43	99.76	101.16	100.30	100.92	100.50
Si	0.000	0.000	0.001	0.002	0.001	0.000	0.001	0.001	0.000
Ti	0.893	0.897	0.836	0.829	0.895	0.864	0.845	0.845	0.849
Al	0.027	0.024	0.013	0.014	0.024	0.016	0.013	0.013	0.014
Nb	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.003	0.001
Zr	0.002	0.002	0.000	0.002	0.001	0.002	0.001	0.002	0.000
Cr	0.017	0.015	0.013	0.013	0.025	0.010	0.010	0.010	0.010
Fe^{3+}	0.214	0.223	0.306	0.311	0.243	0.307	0.292	0.301	0.295
Fe^{2+}	0.482	0.479	0.569	0.558	0.410	0.476	0.563	0.559	0.564
Mn	0.006	0.006	0.006	0.007	0.009	0.006	0.006	0.006	0.005
Mg	0.410	0.417	0.268	0.271	0.478	0.388	0.282	0.286	0.278
Ca	0.001	0.001	0.000	0.001	0.004	0.000	0.001	0.000	0.000
Zn	0.001	0.001	0.001	0.003	0.000	0.001	0.001	0.002	0.002
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.002	0.002	0.000	0.000	0.003	0.002	0.000	0.002	0.002
% geikielite	40.8	41.1	27.0	27.3	46.9	37.9	28.3	28.5	28.0
% hematites	10.6	11.0	15.3	15.7	11.9	15.0	14.7	15.1	14.8
% ilmenite	48.0	47.3	57.1	56.3	40.2	46.5	56.5	55.8	56.7
% pirofanite	0.6	0.6	0.6	0.7	0.9	0.6	0.6	0.6	0.5

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	518-267a_d_152	618-47_b_086	618-47_b_087	35_i_060	35_i_061	22_e_077	26_j_031	26_j_032	26_j_033
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info	partially altered	partially altered	partially altered	Mg-rich	Mg-rich	Mg-rich	mg-rich	mg-rich	mg-rich
analysed area	core	core	core	core	core	core	core	core	core
SiO_2	0.00	0.02	0.05	0.10	0.03	0.00	0.00	0.02	0.02
TiO_2	47.29	55.81	55.53	53.81	46.45	50.70	49.63	52.48	49.11
Al_2O_3	0.47	0.42	0.50	0.57	0.54	0.53	1.00	0.78	0.98
Nb_2O_5	0.14	0.05	0.11	0.08	0.36	0.15	0.48	0.31	0.41
ZrO_2	0.04	0.14	0.00	0.16	0.12	0.19	0.08	0.12	0.06
Cr_2O_3	0.56	2.13	1.88	0.86	0.83	1.03	0.97	1.12	0.90
Fe_2O_3	15.60	4.18	5.57	7.24	16.74	10.55	11.84	8.88	12.75
FeO	28.29	17.14	16.78	24.19	28.39	26.30	23.81	22.92	24.53
MnO	0.28	2.60	2.06	0.36	0.17	0.21	0.39	0.56	0.42
MgO	7.89	17.01	17.42	13.47	7.57	10.54	11.65	13.46	10.97
CaO	0.02	0.10	0.07	0.05	0.00	0.37	0.04	0.04	0.06
ZnO	0.00	0.06	0.02	0.00	0.13	0.00	0.02	0.00	0.00
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.05	0.09	0.11	0.08	0.11	0.11	0.18	0.11	0.10
sum	100.63	99.75	100.10	100.97	101.45	100.68	100.09	100.80	100.31
Si	0.000	0.000	0.001	0.002	0.001	0.000	0.000	0.000	0.000
Ti	0.857	1.011	1.006	0.975	0.841	0.918	0.899	0.951	0.889
Al	0.013	0.012	0.014	0.016	0.015	0.015	0.028	0.022	0.028
Nb	0.002	0.001	0.001	0.001	0.004	0.002	0.005	0.003	0.004
Zr	0.000	0.002	0.000	0.002	0.001	0.002	0.001	0.001	0.001
Cr	0.011	0.041	0.036	0.016	0.016	0.020	0.018	0.021	0.017
Fe^{3+}	0.283	0.076	0.101	0.131	0.303	0.191	0.214	0.161	0.231
Fe^{2+}	0.570	0.345	0.338	0.487	0.572	0.530	0.479	0.461	0.494
Mn	0.006	0.053	0.042	0.007	0.003	0.004	0.008	0.011	0.009
Mg	0.283	0.610	0.625	0.483	0.272	0.378	0.418	0.483	0.394
Ca	0.001	0.003	0.002	0.001	0.000	0.010	0.001	0.001	0.002
Zn	0.000	0.001	0.000	0.000	0.002	0.000	0.000	0.000	0.000
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.001	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.002
% geikielite	28.3	58.3	59.2	46.3	27.2	37.5	41.3	46.6	38.9
% hematites	14.1	3.6	4.8	6.3	15.2	9.5	10.6	7.8	11.4
% ilmenite	57.0	33.0	32.0	46.7	57.3	52.6	47.3	44.5	48.8
% pirofanite	0.6	5.1	4.0	0.7	0.3	0.4	0.8	1.1	0.8

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	59-B4_a_030	59-B4_a_031	59-B4_b_038	59-B4_b_040	59-B4_b_041	618-47_a_077	618-47_a_078	618-47_a_080	618-47_g_111
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info	Mg-rich	Mg-rich	Mg-rich	Mg-rich	Mg-rich	Mg-rich	Mg-rich	Mg-rich	Mg-rich
analysed area	core	core	core	core	core	rim	rim	rim	rim
SiO_2	0.04	0.02	0.00	0.01	0.00	0.03	0.04	0.04	0.03
TiO_2	50.98	49.87	49.17	53.61	53.40	53.68	52.70	52.43	51.60
Al_2O_3	0.54	0.46	0.55	0.61	0.61	0.52	0.48	0.41	0.55
Nb_2O_5	0.01	0.06	0.15	0.21	0.12	0.19	0.17	0.03	0.24
ZrO_2	0.10	0.09	0.06	0.13	0.00	0.06	0.00	0.00	0.05
Cr_2O_3	0.85	0.73	0.30	0.24	0.30	0.51	0.51	0.48	1.50
Fe_2O_3	9.78	12.96	14.48	8.34	7.96	9.78	9.26	9.55	8.93
FeO	24.33	24.24	24.22	24.10	24.47	18.29	22.09	22.10	23.10
MnO	1.65	0.81	0.32	0.42	0.40	1.20	1.28	1.84	1.09
MgO	11.11	11.04	11.02	13.32	12.99	16.22	13.52	12.99	12.51
CaO	0.09	0.06	0.04	0.09	0.05	0.03	0.04	0.03	0.05
ZnO	0.00	0.06	0.09	0.00	0.00	0.01	0.00	0.00	0.02
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.06	0.14	0.11	0.16	0.07	0.10	0.10	0.09	0.16
sum	99.54	100.54	100.51	101.25	100.38	100.62	100.20	99.99	99.83
Si	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001
Ti	0.923	0.903	0.891	0.971	0.967	0.972	0.955	0.950	0.935
Al	0.015	0.013	0.016	0.017	0.017	0.015	0.014	0.012	0.016
Nb	0.000	0.001	0.002	0.002	0.001	0.002	0.002	0.000	0.003
Zr	0.001	0.001	0.001	0.002	0.000	0.001	0.000	0.000	0.001
Cr	0.016	0.014	0.006	0.005	0.006	0.010	0.010	0.009	0.029
Fe^{3+}	0.177	0.235	0.262	0.151	0.144	0.177	0.168	0.173	0.162
Fe^{2+}	0.490	0.488	0.488	0.485	0.493	0.368	0.445	0.445	0.465
Mn	0.034	0.017	0.007	0.009	0.008	0.024	0.026	0.038	0.022
Mg	0.399	0.396	0.396	0.478	0.466	0.582	0.485	0.466	0.449
Ca	0.002	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.001
Zn	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.001	0.003	0.002	0.003	0.001	0.002	0.002	0.002	0.003
% geikielite	39.4	38.9	38.7	45.6	44.9	54.7	46.7	45.0	44.1
% hematites	8.8	11.5	12.8	7.2	6.9	8.3	8.1	8.4	8.0
% ilmenite	48.5	47.9	47.8	46.3	47.4	34.6	42.8	43.0	45.7
% pirofanite	3.3	1.6	0.6	0.8	0.8	2.3	2.5	3.6	2.2

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	618-47_g_112	618-47_g_113	618-47_g_114	22_g_082	22_g_083	22_f_080	22_g_081	59-B4_b_042	35_i_059
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Cat-115	Cat-115	Cat-115	Cat-115	Tchiuzo	Cat-115
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info	Mg-rich	Mg-rich	Mg-rich	Mg-rich	Mg-rich	Mg-rich	Mg-rich	Mg-rich	
analysed area	rim	core	rim	core	core	core	core	core	core
SiO_2	0.00	0.10	0.02	0.05	0.05	0.05	0.04	0.04	0.02
TiO_2	53.18	44.11	44.29	52.30	51.72	50.99	51.53	53.54	46.19
Al_2O_3	0.49	0.60	0.56	1.06	1.01	0.87	0.94	0.58	0.54
Nb_2O_5	0.04	0.36	0.31	0.38	0.39	0.23	0.11	0.04	0.14
ZrO_2	0.02	0.15	0.13	0.19	0.16	0.03	0.11	0.04	0.12
Cr_2O_3	1.42	1.13	1.18	1.49	1.33	1.28	1.10	0.33	0.85
Fe_2O_3	7.86	17.10	19.61	6.33	7.42	8.83	8.26	7.73	17.24
FeO	22.11	25.69	22.85	23.52	25.76	23.69	26.18	24.43	27.51
MnO	1.23	0.31	0.30	1.75	0.62	0.50	0.35	0.29	0.28
MgO	13.57	7.91	9.54	12.43	11.58	12.15	11.11	13.09	7.79
CaO	0.07	0.03	0.02	0.00	0.03	0.09	0.03	0.07	0.00
ZnO	0.13	0.04	0.03	0.07	0.00	0.11	0.05	0.00	0.00
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.15	0.10	0.07	0.12	0.03	0.13	0.17	0.14	0.12
sum	100.27	97.63	98.90	99.69	100.10	98.95	99.98	100.31	100.80
Si	0.000	0.002	0.000	0.001	0.001	0.001	0.001	0.001	0.000
Ti	0.963	0.799	0.802	0.947	0.937	0.924	0.933	0.970	0.837
Al	0.014	0.017	0.016	0.030	0.029	0.025	0.027	0.016	0.015
Nb	0.000	0.004	0.003	0.004	0.004	0.003	0.001	0.000	0.002
Zr	0.000	0.002	0.002	0.002	0.002	0.000	0.001	0.000	0.001
Cr	0.027	0.022	0.022	0.028	0.025	0.024	0.021	0.006	0.016
Fe^{3+}	0.142	0.310	0.355	0.115	0.134	0.160	0.150	0.140	0.312
Fe^{2+}	0.445	0.517	0.460	0.474	0.519	0.477	0.527	0.492	0.554
Mn	0.025	0.006	0.006	0.036	0.013	0.010	0.007	0.006	0.006
Mg	0.487	0.284	0.342	0.446	0.416	0.436	0.399	0.470	0.280
Ca	0.002	0.001	0.001	0.000	0.001	0.002	0.001	0.002	0.000
Zn	0.002	0.001	0.001	0.001	0.000	0.002	0.001	0.000	0.000
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.003	0.002	0.001	0.002	0.001	0.003	0.003	0.003	0.002
% geikielite	47.4	29.5	34.7	44.0	41.0	43.5	39.6	45.3	28.1
% hematites	6.9	16.1	18.0	5.7	6.6	8.0	7.4	6.7	15.7
% ilmenite	43.3	53.7	46.6	46.8	51.1	47.5	52.3	47.4	55.7
% pirofanite	2.4	0.7	0.6	3.5	1.2	1.0	0.7	0.6	0.6

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	35_i_062	37_h_024	11_f_120	11_f_120	22_b_068	22_b_069	22_c_070	22_d_071	22_d_072
Kimberlite	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info	Mg-rich								
analysed area	core	core	core	core	core	core	core	core	core
SiO_2	0.04	0.12	0.35	0.59	0.09	0.09	0.10	0.05	0.05
TiO_2	54.12	44.79	43.13	43.06	49.06	48.81	49.62	48.63	48.96
Al_2O_3	0.53	0.50	0.47	0.47	0.55	0.54	0.53	0.55	0.50
Nb_2O_5	0.09	0.36	0.32	0.31	0.11	0.22	0.22	0.12	0.39
ZrO_2	0.00	0.24	0.06	0.18	0.08	0.03	0.01	0.00	0.03
Cr_2O_3	0.98	0.70	1.46	1.34	0.96	1.04	1.02	1.06	1.02
Fe_2O_3	6.30	18.04	18.92	18.61	12.03	11.44	11.05	12.77	11.57
FeO	23.95	28.40	28.10	28.43	29.35	29.19	29.39	28.28	29.24
MnO	0.46	0.27	0.33	0.21	0.34	0.19	0.27	0.23	0.22
MgO	13.54	6.77	6.20	6.22	8.22	8.27	8.51	8.48	8.35
CaO	0.08	0.01	0.00	0.00	0.00	0.00	0.01	0.02	0.00
ZnO	0.06	0.11	0.00	0.07	0.00	0.06	0.06	0.10	0.08
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.13	0.12	0.12	0.09	0.06	0.10	0.10	0.20	0.13
sum	100.28	100.43	99.46	99.58	100.86	99.98	100.90	100.49	100.54
Si	0.001	0.003	0.008	0.014	0.002	0.002	0.002	0.001	0.001
Ti	0.980	0.811	0.781	0.780	0.889	0.884	0.899	0.881	0.887
Al	0.015	0.014	0.013	0.013	0.016	0.015	0.015	0.016	0.014
Nb	0.001	0.004	0.003	0.003	0.001	0.002	0.002	0.001	0.004
Zr	0.000	0.003	0.001	0.002	0.001	0.000	0.000	0.000	0.000
Cr	0.019	0.013	0.028	0.026	0.018	0.020	0.019	0.020	0.019
Fe^{3+}	0.114	0.327	0.343	0.337	0.218	0.207	0.200	0.231	0.210
Fe^{2+}	0.482	0.572	0.566	0.572	0.591	0.588	0.592	0.569	0.589
Mn	0.009	0.006	0.007	0.004	0.007	0.004	0.006	0.005	0.004
Mg	0.486	0.243	0.223	0.223	0.295	0.297	0.305	0.304	0.300
Ca	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000
Zn	0.001	0.002	0.000	0.001	0.000	0.001	0.001	0.002	0.001
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.003	0.002	0.002	0.002	0.001	0.002	0.002	0.004	0.003
% geikielite	47.0	24.7	23.0	23.0	29.4	29.9	30.5	30.6	30.0
% hematites	5.5	16.6	17.7	17.4	10.9	10.4	10.0	11.6	10.5
% ilmenite	46.6	58.1	58.5	59.1	59.0	59.2	59.0	57.3	59.0
% pirofanite	0.9	0.6	0.7	0.4	0.7	0.4	0.5	0.5	0.4

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	22_d_073	22_d_074	26_c_006	26_c_007	26_c_008	32A_l_097	32A_l_099	50_1a_095	50_1a_096
Kimberlite	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115	Tchiuzo	Tchiuzo
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info									
analysed area	core	core	core	core	rim	med	rim	core	core
SiO_2	0.21	0.06	0.01	0.02	0.00	0.07	0.02	0.06	0.02
TiO_2	48.27	48.65	45.80	45.13	45.23	46.97	48.14	48.25	48.48
Al_2O_3	0.56	0.56	0.51	0.54	0.56	0.62	0.52	0.57	0.63
Nb_2O_5	0.21	0.11	0.45	0.31	0.24	0.10	0.21	0.08	0.37
ZrO_2	0.18	0.21	0.03	0.11	0.19	0.23	0.09	0.23	0.00
Cr_2O_3	1.02	1.01	0.86	0.94	0.92	0.70	0.71	2.09	2.18
Fe_2O_3	12.31	11.59	16.77	18.40	17.42	14.75	14.17	11.72	11.56
FeO	28.59	29.15	28.36	28.02	28.39	28.06	25.83	27.44	27.69
MnO	0.27	0.16	0.24	0.24	0.23	0.23	0.23	0.34	0.24
MgO	8.39	8.25	7.28	7.10	6.96	8.00	9.75	8.84	8.93
CaO	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
ZnO	0.07	0.00	0.13	0.07	0.00	0.00	0.00	0.00	0.02
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.10	0.06	0.02	0.04	0.03	0.03	0.16	0.16	0.16
sum	100.20	99.81	100.46	100.92	100.16	99.76	99.84	99.78	100.29
Si	0.005	0.001	0.000	0.000	0.000	0.002	0.000	0.001	0.000
Ti	0.874	0.881	0.830	0.817	0.819	0.851	0.872	0.874	0.878
Al	0.016	0.016	0.014	0.015	0.016	0.018	0.015	0.016	0.018
Nb	0.002	0.001	0.005	0.003	0.003	0.001	0.002	0.001	0.004
Zr	0.002	0.002	0.000	0.001	0.002	0.003	0.001	0.003	0.000
Cr	0.019	0.019	0.016	0.018	0.018	0.013	0.014	0.040	0.041
Fe^{3+}	0.223	0.210	0.304	0.333	0.316	0.267	0.257	0.212	0.209
Fe^{2+}	0.576	0.587	0.571	0.564	0.572	0.565	0.520	0.552	0.558
Mn	0.006	0.003	0.005	0.005	0.005	0.005	0.005	0.007	0.005
Mg	0.301	0.296	0.261	0.255	0.250	0.287	0.350	0.317	0.321
Ca	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zn	0.001	0.000	0.002	0.001	0.000	0.000	0.000	0.000	0.000
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.002	0.001	0.000	0.001	0.001	0.001	0.003	0.003	0.003
% geikielite	30.3	29.9	26.4	25.7	25.4	29.0	34.9	32.3	32.5
% hematites	11.2	10.6	15.4	16.8	16.0	13.5	12.8	10.8	10.6
% ilmenite	57.9	59.2	57.7	57.0	58.1	57.0	51.8	56.2	56.5
% pirofanite	0.6	0.3	0.5	0.5	0.5	0.5	0.5	0.7	0.5

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	50_1b_097	50_1c_100	50_1c_101	50_1d_102	50_1d_103	50_1d_104	50_1d_105	59-A2_a_044	59-A2_a_045
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info									
analysed area	core	core	core	core	rim	rim	med	core	core
SiO_2	0.02	0.06	0.06	0.06	0.00	0.02	0.00	0.03	0.00
TiO_2	49.12	47.71	48.32	48.96	48.08	48.19	48.51	51.10	51.36
Al_2O_3	0.58	0.55	0.59	0.55	0.55	0.52	0.57	0.57	0.54
Nb_2O_5	0.29	0.27	0.27	0.26	0.11	0.13	0.13	0.03	0.05
ZrO_2	0.02	0.20	0.03	0.05	0.15	0.05	0.00	0.00	0.00
Cr_2O_3	2.17	2.17	2.04	2.07	2.00	2.13	2.13	0.52	0.50
Fe_2O_3	10.13	11.60	11.49	10.51	12.10	12.22	11.03	9.88	8.80
FeO	28.24	27.36	27.54	28.24	27.00	26.98	27.42	27.96	28.15
MnO	0.23	0.24	0.23	0.32	0.30	0.23	0.30	0.16	0.43
MgO	8.86	8.78	8.92	8.76	8.96	9.02	8.87	9.94	9.86
CaO	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.02	0.00
ZnO	0.06	0.01	0.01	0.06	0.04	0.05	0.03	0.11	0.01
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.22	0.14	0.17	0.19	0.15	0.22	0.20	0.08	0.09
sum	99.94	99.09	99.67	100.03	99.44	99.75	99.20	100.40	99.79
Si	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.000
Ti	0.890	0.864	0.875	0.887	0.871	0.873	0.879	0.926	0.930
Al	0.016	0.016	0.017	0.016	0.016	0.015	0.016	0.016	0.015
Nb	0.003	0.003	0.003	0.003	0.001	0.001	0.001	0.000	0.001
Zr	0.000	0.002	0.000	0.001	0.002	0.001	0.000	0.000	0.000
Cr	0.041	0.041	0.039	0.039	0.038	0.041	0.041	0.010	0.010
Fe^{3+}	0.184	0.210	0.208	0.190	0.219	0.221	0.200	0.179	0.159
Fe^{2+}	0.569	0.551	0.555	0.569	0.544	0.543	0.552	0.563	0.567
Mn	0.005	0.005	0.005	0.007	0.006	0.005	0.006	0.003	0.009
Mg	0.318	0.315	0.320	0.314	0.322	0.324	0.318	0.357	0.354
Ca	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000
Zn	0.001	0.000	0.000	0.001	0.001	0.001	0.001	0.002	0.000
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.004	0.003	0.003	0.004	0.003	0.004	0.004	0.002	0.002
% geikielite	32.3	32.3	32.6	31.9	32.8	33.0	32.6	35.2	35.1
% hematites	9.3	10.8	10.6	9.7	11.2	11.3	10.2	8.8	7.9
% ilmenite	57.8	56.4	56.4	57.7	55.4	55.3	56.5	55.6	56.2
% pirofanite	0.5	0.5	0.5	0.7	0.6	0.5	0.6	0.3	0.9

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	59-A2_a_046	59-A2_a_047	59-A2_a_049	59-A2_a_053	59-A2_c_054	59-A2_c_055	59-A2_c_056	59-A2_c_057	59-A2_c_058
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info									
analysed area	core	core	core	core	core	core	core	core	core
SiO_2	0.03	0.00	0.06	0.04	0.00	0.00	0.03	0.00	0.01
TiO_2	51.10	51.21	51.18	50.99	49.47	49.29	49.09	49.49	50.28
Al_2O_3	0.51	0.52	0.59	0.67	0.47	0.48	0.53	0.47	0.47
Nb_2O_5	0.08	0.06	0.07	0.19	0.14	0.13	0.25	0.02	0.18
ZrO_2	0.12	0.00	0.10	0.05	0.11	0.00	0.04	0.10	0.00
Cr_2O_3	0.52	0.52	0.25	0.27	0.44	0.48	0.43	0.45	0.46
Fe_2O_3	9.99	10.00	10.48	10.89	11.91	12.61	12.20	13.09	10.65
FeO	27.34	27.87	25.38	24.83	28.80	28.29	28.36	28.10	28.47
MnO	0.50	0.22	0.82	0.78	0.30	0.20	0.23	0.31	0.28
MgO	10.21	10.04	11.11	11.43	8.68	8.88	8.84	9.02	9.30
CaO	0.00	0.00	0.02	0.02	0.02	0.01	0.00	0.00	0.01
ZnO	0.00	0.03	0.07	0.07	0.08	0.05	0.09	0.05	0.03
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.12	0.12	0.15	0.07	0.05	0.11	0.06	0.06	0.07
sum	100.52	100.59	100.28	100.30	100.46	100.52	100.15	101.16	100.21
Si	0.001	0.000	0.001	0.001	0.000	0.000	0.001	0.000	0.000
Ti	0.926	0.928	0.927	0.924	0.896	0.893	0.889	0.896	0.911
Al	0.014	0.015	0.017	0.019	0.013	0.014	0.015	0.013	0.013
Nb	0.001	0.001	0.001	0.002	0.002	0.001	0.003	0.000	0.002
Zr	0.001	0.000	0.001	0.001	0.001	0.000	0.000	0.001	0.000
Cr	0.010	0.010	0.005	0.005	0.008	0.009	0.008	0.009	0.009
Fe^{3+}	0.181	0.181	0.190	0.197	0.216	0.228	0.221	0.237	0.193
Fe^{2+}	0.550	0.561	0.511	0.500	0.580	0.570	0.571	0.566	0.573
Mn	0.010	0.004	0.017	0.016	0.006	0.004	0.005	0.006	0.006
Mg	0.366	0.360	0.399	0.410	0.312	0.319	0.317	0.324	0.334
Ca	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000
Zn	0.000	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.002	0.002	0.003	0.001	0.001	0.002	0.001	0.001	0.001
% geikielite	36.0	35.4	39.0	40.0	31.0	31.7	31.6	31.9	33.1
% hematites	8.9	8.9	9.3	9.6	10.7	11.3	11.0	11.7	9.6
% ilmenite	54.1	55.2	50.0	48.8	57.7	56.6	56.9	55.8	56.8
% pirofanite	1.0	0.4	1.6	1.6	0.6	0.4	0.5	0.6	0.6

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	59-A2_c_059	59-A3_a_060	59-A4_a_062	59-A4_a_063	59-A4_a_064	59-A4_a_065	59-A4_a_066	59-A4_b_069	59-A4_b_070
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info									
analysed area	core	core	core	med	rim	core1	core	core	rim
SiO_2	0.02	0.00	0.02	0.30	0.07	0.03	0.02	0.07	0.08
TiO_2	50.80	50.45	52.14	52.37	52.71	51.25	51.58	51.77	52.67
Al_2O_3	0.51	0.49	0.57	0.68	0.55	0.52	0.53	0.46	0.49
Nb_2O_5	0.18	0.15	0.29	0.07	0.13	0.18	0.06	0.13	0.13
ZrO_2	0.19	0.02	0.00	0.06	0.12	0.01	0.06	0.10	0.06
Cr_2O_3	0.42	0.46	0.77	0.83	0.86	0.81	0.86	0.52	0.59
Fe_2O_3	9.87	10.69	8.56	8.91	9.80	9.53	9.63	8.35	8.14
FeO	28.27	27.72	26.60	25.09	21.11	27.34	27.68	28.49	24.14
MnO	0.29	0.28	0.26	0.35	1.94	0.27	0.20	0.31	0.46
MgO	9.73	9.72	11.32	12.30	13.72	10.39	10.37	10.03	12.77
CaO	0.01	0.01	0.05	0.05	0.07	0.01	0.00	0.01	0.08
ZnO	0.05	0.13	0.08	0.01	0.00	0.13	0.00	0.00	0.08
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.07	0.10	0.07	0.14	0.09	0.08	0.16	0.16	0.11
sum	100.41	100.22	100.73	101.16	101.17	100.56	101.16	100.41	99.81
Si	0.000	0.000	0.000	0.007	0.002	0.001	0.000	0.002	0.002
Ti	0.920	0.914	0.944	0.949	0.955	0.928	0.934	0.938	0.954
Al	0.014	0.014	0.016	0.019	0.016	0.015	0.015	0.013	0.014
Nb	0.002	0.002	0.003	0.001	0.001	0.002	0.001	0.001	0.001
Zr	0.002	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.001
Cr	0.008	0.009	0.015	0.016	0.016	0.015	0.016	0.010	0.011
Fe^{3+}	0.179	0.194	0.155	0.161	0.178	0.173	0.175	0.151	0.148
Fe^{2+}	0.569	0.558	0.536	0.505	0.425	0.550	0.557	0.574	0.486
Mn	0.006	0.006	0.005	0.007	0.040	0.006	0.004	0.006	0.009
Mg	0.349	0.349	0.406	0.441	0.492	0.373	0.372	0.360	0.458
Ca	0.000	0.000	0.001	0.001	0.002	0.000	0.000	0.000	0.002
Zn	0.001	0.002	0.001	0.000	0.000	0.002	0.000	0.000	0.001
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.001	0.002	0.001	0.003	0.002	0.002	0.003	0.003	0.002
% geikielite	34.5	34.6	39.7	42.7	47.1	36.7	36.5	35.4	44.6
% hematites	8.8	9.6	7.6	7.8	8.5	8.5	8.5	7.5	7.2
% ilmenite	56.1	55.3	52.3	48.8	40.6	54.2	54.6	56.5	47.3
% pirofanite	0.6	0.6	0.5	0.7	3.8	0.5	0.4	0.6	0.9

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	59-A4_b_071	59-A4_b_073	59-A4_b_074	59-B3_a_011	59-B3_a_012	59-B3_a_013	59-B3_a_017	59-B3_a_018	59-B3_b_019
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info									
analysed area	rim	core	core	core	core	med	core	core	core
SiO_2	0.08	0.00	0.05	0.02	0.02	0.03	0.02	0.06	0.34
TiO_2	53.02	51.45	51.70	46.62	46.12	46.53	46.20	45.89	51.34
Al_2O_3	0.52	0.47	0.52	0.49	0.46	0.49	0.50	0.48	0.51
Nb_2O_5	0.13	0.18	0.22	0.13	0.32	0.32	0.13	0.35	0.11
ZrO_2	0.04	0.01	0.11	0.04	0.04	0.14	0.01	0.00	0.11
Cr_2O_3	0.63	0.53	0.51	0.79	0.85	0.82	0.80	0.76	0.49
Fe_2O_3	5.61	10.03	8.40	15.41	16.06	15.89	16.13	17.64	8.36
FeO	24.80	27.82	28.23	28.42	27.89	28.02	28.07	27.20	28.48
MnO	1.64	0.30	0.29	0.28	0.26	0.48	0.21	0.30	0.27
MgO	11.94	10.26	10.23	7.47	7.59	7.64	7.46	7.89	10.02
CaO	0.07	0.00	0.02	0.01	0.01	0.05	0.01	0.00	0.02
ZnO	0.06	0.00	0.00	0.07	0.11	0.05	0.12	0.08	0.06
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.07	0.07	0.09	0.03	0.09	0.09	0.03	0.10	0.08
sum	98.61	101.13	100.37	99.78	99.82	100.55	99.70	100.75	100.20
Si	0.002	0.000	0.001	0.000	0.000	0.001	0.000	0.001	0.008
Ti	0.960	0.932	0.936	0.844	0.835	0.843	0.837	0.831	0.930
Al	0.015	0.013	0.015	0.014	0.013	0.014	0.014	0.014	0.014
Nb	0.001	0.002	0.002	0.001	0.003	0.003	0.001	0.004	0.001
Zr	0.000	0.000	0.001	0.000	0.000	0.002	0.000	0.000	0.001
Cr	0.012	0.010	0.010	0.015	0.016	0.016	0.015	0.014	0.009
Fe^{3+}	0.102	0.182	0.152	0.279	0.291	0.288	0.292	0.320	0.152
Fe^{2+}	0.499	0.560	0.568	0.572	0.562	0.564	0.565	0.548	0.573
Mn	0.033	0.006	0.006	0.006	0.005	0.010	0.004	0.006	0.006
Mg	0.429	0.368	0.367	0.268	0.272	0.274	0.268	0.283	0.360
Ca	0.002	0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.001
Zn	0.001	0.000	0.000	0.001	0.002	0.001	0.002	0.001	0.001
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.001	0.001	0.002	0.001	0.002	0.002	0.001	0.002	0.002
% geikielite	42.3	35.9	36.1	27.2	27.7	27.6	27.2	28.4	35.5
% hematites	5.0	8.9	7.5	14.2	14.8	14.5	14.9	16.0	7.5
% ilmenite	49.3	54.6	55.9	58.1	57.0	56.9	57.5	54.9	56.5
% pirofanite	3.3	0.6	0.6	0.6	0.5	1.0	0.4	0.6	0.5

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	59-B3_b_020	59-B3_b_021	59-B3_b_022	59-B3_c_023	59-B3_c_024	59-B3_c_025	59-B4_a_027	59-B4_a_028	59-B4_a_032
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info									
analysed area	core	med	rim	core	med	rim	core	core	core
SiO_2	0.07	0.04	0.03	0.04	0.04	0.11	0.00	0.02	0.00
TiO_2	51.29	51.85	52.09	45.88	46.30	47.06	44.81	44.65	44.89
Al_2O_3	0.50	0.57	0.62	0.51	0.46	0.52	0.43	0.38	0.46
Nb_2O_5	0.16	0.31	0.27	0.30	0.34	0.43	0.29	0.18	0.15
ZrO_2	0.05	0.23	0.14	0.17	0.06	0.05	0.18	0.08	0.33
Cr_2O_3	0.49	0.45	0.48	0.59	0.61	0.61	0.80	0.75	0.76
Fe_2O_3	9.05	8.23	6.82	16.72	16.19	14.90	18.29	18.82	17.79
FeO	27.46	27.46	26.25	28.11	28.50	25.57	28.05	28.13	28.33
MnO	0.31	0.64	2.35	0.24	0.30	1.58	0.23	0.34	0.18
MgO	10.39	10.61	10.37	7.42	7.41	8.74	6.89	6.67	6.86
CaO	0.00	0.03	0.03	0.00	0.00	0.03	0.01	0.00	0.00
ZnO	0.00	0.06	0.04	0.11	0.02	0.06	0.02	0.00	0.00
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.13	0.05	0.08	0.07	0.07	0.12	0.14	0.07	0.00
sum	99.91	100.52	99.57	100.15	100.30	99.78	100.14	100.09	99.74
Si	0.002	0.001	0.001	0.001	0.001	0.003	0.000	0.000	0.000
Ti	0.929	0.939	0.943	0.831	0.839	0.852	0.812	0.809	0.813
Al	0.014	0.016	0.018	0.014	0.013	0.015	0.012	0.011	0.013
Nb	0.002	0.003	0.003	0.003	0.004	0.005	0.003	0.002	0.002
Zr	0.001	0.003	0.002	0.002	0.001	0.001	0.002	0.001	0.004
Cr	0.009	0.009	0.009	0.011	0.012	0.012	0.015	0.014	0.014
Fe^{3+}	0.164	0.149	0.124	0.303	0.293	0.270	0.331	0.341	0.322
Fe^{2+}	0.553	0.553	0.529	0.566	0.574	0.515	0.565	0.566	0.570
Mn	0.006	0.013	0.048	0.005	0.006	0.032	0.005	0.007	0.004
Mg	0.373	0.381	0.372	0.266	0.266	0.314	0.247	0.239	0.246
Ca	0.000	0.001	0.001	0.000	0.000	0.001	0.000	0.000	0.000
Zn	0.000	0.001	0.001	0.002	0.000	0.001	0.000	0.000	0.000
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.003	0.001	0.002	0.001	0.001	0.002	0.003	0.001	0.000
% geikielite	36.8	37.3	36.8	26.9	26.8	31.5	25.2	24.3	25.1
% hematites	8.1	7.3	6.1	15.3	14.8	13.6	16.9	17.3	16.4
% ilmenite	54.5	54.1	52.3	57.3	57.8	51.7	57.5	57.6	58.1
% pirofanite	0.6	1.3	4.7	0.5	0.6	3.2	0.5	0.7	0.4

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	59-B4_b_043	60A_1a_032	60A_1a_033	60A_1b_034	60A_1b_035	60A_1b_036	60A_2a_038	60A_2b_039	60A_2b_040
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info									
analysed area	core	core	core	rim	med	med	core	med	med
SiO_2	0.01	0.14	0.28	0.12	0.13	0.39	0.41	0.27	0.32
TiO_2	48.12	47.17	47.05	47.16	47.00	46.91	42.85	43.28	43.61
Al_2O_3	0.53	0.58	0.53	0.56	0.49	0.42	0.30	0.35	0.32
Nb_2O_5	0.44	0.29	0.13	0.31	0.27	0.18	0.25	0.29	0.30
ZrO_2	0.00	0.07	0.14	0.08	0.06	0.19	0.08	0.00	0.14
Cr_2O_3	0.26	0.51	0.53	0.51	0.50	0.49	1.00	0.92	0.98
Fe_2O_3	13.99	14.42	14.13	14.54	15.12	15.10	20.70	20.33	18.79
FeO	29.14	28.70	29.05	26.48	27.31	28.64	28.03	28.05	28.86
MnO	0.25	0.28	0.32	0.27	0.26	0.28	0.30	0.23	0.28
MgO	8.02	7.77	7.48	9.02	8.45	7.83	6.17	6.29	6.06
CaO	0.01	0.00	0.04	0.03	0.01	0.00	0.00	0.00	0.00
ZnO	0.00	0.03	0.00	0.04	0.00	0.00	0.01	0.00	0.01
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00
NiO	0.08	0.10	0.13	0.04	0.12	0.09	0.01	0.08	0.07
sum	100.84	100.05	99.81	99.17	99.71	100.53	100.11	100.11	99.73
Si	0.000	0.003	0.007	0.003	0.003	0.009	0.010	0.007	0.008
Ti	0.872	0.854	0.852	0.854	0.851	0.850	0.776	0.784	0.790
Al	0.015	0.016	0.015	0.016	0.014	0.012	0.009	0.010	0.009
Nb	0.005	0.003	0.001	0.003	0.003	0.002	0.003	0.003	0.003
Zr	0.000	0.001	0.002	0.001	0.001	0.002	0.001	0.000	0.002
Cr	0.005	0.010	0.010	0.010	0.010	0.009	0.019	0.018	0.019
Fe^{3+}	0.253	0.261	0.256	0.263	0.274	0.274	0.375	0.368	0.340
Fe^{2+}	0.587	0.578	0.585	0.533	0.550	0.577	0.564	0.565	0.581
Mn	0.005	0.006	0.007	0.006	0.005	0.006	0.006	0.005	0.006
Mg	0.288	0.279	0.268	0.324	0.303	0.281	0.221	0.226	0.217
Ca	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000
Zn	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.002	0.002	0.003	0.001	0.002	0.002	0.000	0.002	0.001
% geikielite	28.6	28.1	27.2	32.6	30.5	28.1	22.6	23.1	22.3
% hematites	12.6	13.2	13.0	13.2	13.8	13.7	19.1	18.8	17.5
% ilmenite	58.3	58.2	59.2	53.6	55.2	57.7	57.6	57.7	59.6
% pirofanite	0.5	0.6	0.7	0.6	0.5	0.6	0.6	0.5	0.6

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	60A_3a_042	60A_3a_043	60A_3a_044	60A_4a_048	60A_4a_049	60A_5a_054	60A_5a_055	60A_5a_056	60A_5a_057
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info									
analysed area	core	core	core	core	core	core	core	med	med
SiO_2	0.31	0.16	0.23	0.35	0.23	0.29	0.17	0.37	0.23
TiO_2	48.26	47.94	48.36	50.84	50.71	50.34	50.21	50.67	50.28
Al_2O_3	0.50	0.48	0.49	0.37	0.49	0.44	0.46	0.59	0.51
Nb_2O_5	0.18	0.20	0.26	0.29	0.02	0.20	0.34	0.22	0.18
ZrO_2	0.04	0.05	0.07	0.08	0.17	0.14	0.21	0.02	0.18
Cr_2O_3	0.26	0.28	0.26	0.39	0.39	0.40	0.40	0.43	0.44
Fe_2O_3	12.37	14.14	12.80	8.71	8.96	9.44	10.42	8.76	9.53
FeO	29.32	28.46	29.31	28.45	28.02	28.41	27.98	28.63	28.35
MnO	0.22	0.24	0.26	0.24	0.27	0.29	0.28	0.28	0.24
MgO	8.07	8.31	8.14	9.92	9.87	9.59	9.80	9.68	9.60
CaO	0.00	0.00	0.00	0.01	0.01	0.02	0.01	0.00	0.00
ZnO	0.00	0.00	0.02	0.03	0.01	0.00	0.00	0.00	0.02
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
NiO	0.08	0.05	0.00	0.10	0.11	0.11	0.12	0.11	0.08
sum	99.61	100.31	100.20	99.78	99.26	99.67	100.40	99.77	99.64
Si	0.007	0.004	0.006	0.008	0.006	0.007	0.004	0.009	0.006
Ti	0.874	0.868	0.876	0.921	0.918	0.912	0.909	0.918	0.911
Al	0.014	0.014	0.014	0.010	0.014	0.012	0.013	0.017	0.014
Nb	0.002	0.002	0.003	0.003	0.000	0.002	0.004	0.002	0.002
Zr	0.000	0.001	0.001	0.001	0.002	0.002	0.002	0.000	0.002
Cr	0.005	0.005	0.005	0.007	0.007	0.008	0.008	0.008	0.008
Fe^{3+}	0.224	0.256	0.232	0.158	0.162	0.171	0.189	0.159	0.173
Fe^{2+}	0.590	0.573	0.590	0.573	0.564	0.572	0.563	0.576	0.571
Mn	0.004	0.005	0.005	0.005	0.006	0.006	0.006	0.006	0.005
Mg	0.290	0.298	0.292	0.356	0.354	0.344	0.352	0.347	0.345
Ca	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
Zn	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.002	0.001	0.000	0.002	0.002	0.002	0.002	0.002	0.002
% geikielite	29.1	29.7	29.1	35.2	35.2	34.2	34.6	34.4	34.2
% hematites	11.2	12.8	11.6	7.8	8.1	8.5	9.3	7.9	8.6
% ilmenite	59.2	57.1	58.8	56.6	56.1	56.8	55.5	57.1	56.7
% pirofanite	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	60A_5a_058	60A_6c_067	60B_1a_068	60B_1a_070	60B_1b_071	60B_1b_072	60B_1b_073	60B_1c_075	60B_1c_076
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info									
analysed area	rim	rim	core	core	core	core	core	core	core
SiO_2	0.39	0.12	0.18	0.25	0.21	0.34	0.26	0.73	0.73
TiO_2	50.46	50.50	51.86	50.35	46.96	45.38	41.17	45.83	42.27
Al_2O_3	0.49	0.54	0.78	0.74	0.98	1.03	1.09	0.27	0.30
Nb_2O_5	0.00	0.00	0.11	0.42	0.32	0.40	0.24	0.61	0.45
ZrO_2	0.00	0.00	0.00	0.00	0.25	0.07	0.14	0.29	0.34
Cr_2O_3	0.37	0.29	2.35	2.62	3.21	4.00	5.05	1.77	2.47
Fe_2O_3	9.83	9.78	7.58	8.54	13.14	14.00	20.30	6.45	17.56
FeO	28.25	29.29	25.23	26.02	25.48	24.44	23.02	30.26	28.86
MnO	0.24	0.30	0.23	0.23	0.24	0.22	0.16	0.11	0.05
MgO	9.65	8.90	11.96	10.99	9.60	9.39	8.04	6.96	5.93
CaO	0.02	0.04	0.01	0.00	0.01	0.01	0.00	0.06	0.00
ZnO	0.05	0.02	0.00	0.03	0.00	0.12	0.02	0.02	0.00
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.01	0.00
NiO	0.10	0.05	0.20	0.18	0.14	0.19	0.16	0.06	0.10
sum	99.84	99.83	100.49	100.38	100.55	99.59	99.90	93.43	99.07
Si	0.009	0.003	0.004	0.006	0.005	0.008	0.006	0.018	0.018
Ti	0.914	0.915	0.939	0.912	0.851	0.822	0.746	0.830	0.766
Al	0.014	0.015	0.022	0.021	0.028	0.029	0.031	0.008	0.009
Nb	0.000	0.000	0.001	0.005	0.003	0.004	0.003	0.007	0.005
Zr	0.000	0.000	0.000	0.000	0.003	0.001	0.002	0.003	0.004
Cr	0.007	0.006	0.045	0.050	0.061	0.076	0.096	0.034	0.047
Fe^{3+}	0.178	0.177	0.137	0.155	0.238	0.254	0.368	0.117	0.318
Fe^{2+}	0.569	0.590	0.508	0.524	0.513	0.492	0.464	0.609	0.581
Mn	0.005	0.006	0.005	0.005	0.005	0.004	0.003	0.002	0.001
Mg	0.346	0.319	0.429	0.394	0.345	0.337	0.289	0.250	0.213
Ca	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.002	0.000
Zn	0.001	0.000	0.000	0.001	0.000	0.002	0.000	0.000	0.000
V	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000
Ni	0.002	0.001	0.004	0.003	0.003	0.004	0.003	0.001	0.002
% geikielite	34.3	31.8	42.5	39.4	35.1	35.1	30.7	27.2	22.3
% hematites	8.8	8.8	6.8	7.7	12.1	13.2	19.6	6.4	16.7
% ilmenite	56.4	58.7	50.3	52.4	52.3	51.2	49.4	66.2	60.9
% pirofanite	0.5	0.6	0.5	0.5	0.5	0.5	0.3	0.2	0.1

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	60B_1f_080	65_1_003	65_1_004	65_1b_005	65_1b_006	65_1c_007	65_1c_008	65_1d_012	65_1d_013
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info									
analysed area	core	core	core	core	core	core	core	core	core
SiO_2	0.10	0.07	0.05	0.06	0.09	0.06	0.06	0.00	0.00
TiO_2	52.44	47.39	46.81	47.13	47.12	47.19	47.13	47.14	47.56
Al_2O_3	0.80	0.46	0.53	0.54	0.55	0.51	0.53	0.47	0.53
Nb_2O_5	0.08	0.25	0.15	0.24	0.20	0.21	0.16	0.18	0.04
ZrO_2	0.00	0.00	0.19	0.01	0.10	0.00	0.03	0.02	0.00
Cr_2O_3	2.79	0.43	0.50	0.50	0.46	0.47	0.44	0.41	0.45
Fe_2O_3	6.06	14.68	14.97	14.36	15.01	15.06	14.48	15.58	14.46
FeO	25.27	28.59	28.23	28.75	28.60	26.63	28.27	28.10	28.58
MnO	0.23	0.27	0.29	0.25	0.32	1.21	0.29	0.32	0.30
MgO	12.13	7.81	7.76	7.70	7.77	8.27	7.85	7.84	7.74
CaO	0.03	0.03	0.00	0.00	0.00	0.01	0.00	0.02	0.00
ZnO	0.04	0.06	0.04	0.00	0.00	0.06	0.04	0.12	0.08
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.19	0.11	0.05	0.00	0.00	0.09	0.07	0.08	0.08
sum	100.16	100.15	99.57	99.55	100.21	99.77	99.35	100.28	99.82
Si	0.002	0.002	0.001	0.001	0.002	0.001	0.001	0.000	0.000
Ti	0.950	0.858	0.848	0.854	0.853	0.855	0.854	0.854	0.861
Al	0.023	0.013	0.015	0.015	0.016	0.014	0.015	0.013	0.015
Nb	0.001	0.003	0.002	0.003	0.002	0.002	0.002	0.002	0.000
Zr	0.000	0.000	0.002	0.000	0.001	0.000	0.000	0.000	0.000
Cr	0.053	0.008	0.010	0.010	0.009	0.009	0.008	0.008	0.009
Fe^{3+}	0.110	0.266	0.271	0.260	0.272	0.273	0.262	0.282	0.262
Fe^{2+}	0.509	0.576	0.568	0.579	0.576	0.536	0.569	0.566	0.575
Mn	0.005	0.006	0.006	0.005	0.007	0.025	0.006	0.007	0.006
Mg	0.435	0.280	0.279	0.276	0.279	0.297	0.282	0.281	0.278
Ca	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000
Zn	0.001	0.001	0.001	0.000	0.000	0.001	0.001	0.002	0.001
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.004	0.002	0.001	0.000	0.000	0.002	0.001	0.002	0.002
% geikielite	43.4	28.2	28.2	27.9	28.0	29.9	28.5	28.3	28.1
% hematites	5.5	13.4	13.7	13.1	13.6	13.7	13.3	14.2	13.2
% ilmenite	50.7	57.9	57.5	58.4	57.7	53.9	57.6	56.9	58.1
% pirofanite	0.5	0.6	0.6	0.5	0.7	2.5	0.6	0.7	0.6

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	65_1d_014	65_1d_015	65_2a_016	65_2b_017	65_2b_018	65_2b_019	65_3a_024	65_3a_025	65_4a_028
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info									
analysed area	core	core	core	core	med	rim	core	core	core
SiO_2	0.08	0.08	0.02	0.00	0.07	0.04	0.10	0.07	0.09
TiO_2	46.61	47.40	47.30	47.40	47.36	47.49	46.92	47.12	47.26
Al_2O_3	0.55	0.52	0.54	0.49	0.55	0.50	0.49	0.52	0.52
Nb_2O_5	0.14	0.23	0.29	0.31	0.33	0.15	0.13	0.36	0.27
ZrO_2	0.08	0.21	0.13	0.05	0.00	0.15	0.21	0.07	0.12
Cr_2O_3	0.46	0.47	0.47	0.49	0.50	0.43	0.49	0.51	0.51
Fe_2O_3	15.27	13.96	14.44	14.36	14.08	15.60	14.99	14.86	14.17
FeO	27.96	29.24	29.01	28.88	29.04	28.12	28.28	28.74	28.90
MnO	0.24	0.35	0.22	0.26	0.23	0.42	0.26	0.25	0.20
MgO	7.70	7.56	7.65	7.67	7.63	7.97	7.84	7.73	7.70
CaO	0.00	0.00	0.00	0.00	0.02	0.04	0.00	0.00	0.00
ZnO	0.09	0.02	0.00	0.08	0.02	0.11	0.00	0.01	0.07
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.22	0.02	0.10	0.12	0.13	0.12	0.07	0.12	0.10
sum	99.40	100.06	100.17	100.11	99.96	101.14	99.78	100.37	99.91
Si	0.002	0.002	0.000	0.000	0.002	0.001	0.002	0.002	0.002
Ti	0.844	0.859	0.857	0.859	0.858	0.860	0.850	0.853	0.856
Al	0.016	0.015	0.015	0.014	0.016	0.014	0.014	0.015	0.015
Nb	0.002	0.003	0.003	0.003	0.004	0.002	0.001	0.004	0.003
Zr	0.001	0.002	0.002	0.001	0.000	0.002	0.002	0.001	0.001
Cr	0.009	0.009	0.009	0.009	0.010	0.008	0.009	0.010	0.010
Fe^{3+}	0.277	0.253	0.262	0.260	0.255	0.283	0.272	0.269	0.257
Fe^{2+}	0.563	0.589	0.584	0.582	0.585	0.566	0.569	0.579	0.582
Mn	0.005	0.007	0.004	0.005	0.005	0.009	0.005	0.005	0.004
Mg	0.276	0.271	0.275	0.275	0.274	0.286	0.281	0.277	0.276
Ca	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000
Zn	0.002	0.000	0.000	0.001	0.000	0.002	0.000	0.000	0.001
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.004	0.000	0.002	0.002	0.003	0.002	0.001	0.002	0.002
% geikielite	28.1	27.3	27.6	27.7	27.6	28.5	28.4	27.9	27.9
% hematites	14.1	12.7	13.2	13.1	12.9	14.1	13.7	13.5	13.0
% ilmenite	57.3	59.2	58.8	58.6	59.0	56.5	57.4	58.1	58.7
% pirofanite	0.5	0.7	0.5	0.5	0.5	0.9	0.5	0.5	0.4

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	65_4a_029	510-67.3a_a_12	510-67.3a_b_12	618-47_a_075	618-47_a_076	618-47_c_091	618-47_c_092	618-47_f_108	618-47_f_109
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info									
analysed area	core	core	core	med	core	core	core	core	core
SiO_2	0.09	0.05	0.00	0.01	0.02	0.08	0.05	0.01	0.05
TiO_2	47.11	51.48	44.56	51.55	51.71	46.86	46.75	49.69	49.53
Al_2O_3	0.59	0.52	0.40	0.46	0.51	0.53	0.47	0.53	0.55
Nb_2O_5	0.19	0.11	0.36	0.10	0.22	0.19	0.47	0.13	0.13
ZrO_2	0.16	0.00	0.22	0.05	0.03	0.07	0.20	0.12	0.00
Cr_2O_3	0.45	0.54	0.76	0.48	0.52	0.49	0.56	0.28	0.25
Fe_2O_3	14.05	8.37	18.12	9.21	9.59	14.93	14.83	11.63	11.42
FeO	28.59	27.24	28.69	27.28	26.84	28.68	28.06	28.18	28.13
MnO	0.27	0.64	0.41	0.29	0.23	0.27	0.30	0.29	0.39
MgO	7.72	10.37	6.41	10.55	10.95	7.52	7.94	9.13	9.02
CaO	0.01	0.00	0.02	0.00	0.04	0.01	0.05	0.01	0.02
ZnO	0.05	0.06	0.01	0.03	0.00	0.04	0.10	0.10	0.08
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.11	0.06	0.04	0.12	0.16	0.09	0.07	0.08	0.06
sum	99.39	99.45	100.00	100.13	100.82	99.77	99.86	100.18	99.62
Si	0.002	0.001	0.000	0.000	0.000	0.002	0.001	0.000	0.001
Ti	0.853	0.932	0.807	0.934	0.937	0.849	0.847	0.900	0.897
Al	0.017	0.015	0.011	0.013	0.014	0.015	0.013	0.015	0.016
Nb	0.002	0.001	0.004	0.001	0.002	0.002	0.005	0.001	0.001
Zr	0.002	0.000	0.003	0.001	0.000	0.001	0.002	0.001	0.000
Cr	0.009	0.010	0.014	0.009	0.010	0.009	0.011	0.005	0.005
Fe^{3+}	0.255	0.152	0.328	0.167	0.174	0.271	0.269	0.211	0.207
Fe^{2+}	0.576	0.549	0.578	0.549	0.540	0.578	0.565	0.567	0.566
Mn	0.006	0.013	0.008	0.006	0.005	0.006	0.006	0.006	0.008
Mg	0.277	0.372	0.230	0.379	0.393	0.270	0.285	0.328	0.324
Ca	0.000	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001
Zn	0.001	0.001	0.000	0.001	0.000	0.001	0.002	0.002	0.001
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.002	0.001	0.001	0.002	0.003	0.002	0.001	0.002	0.001
% geikielite	28.1	36.9	23.5	37.2	38.3	27.3	28.8	32.6	32.3
% hematites	12.9	7.5	16.7	8.2	8.5	13.7	13.6	10.5	10.3
% ilmenite	58.4	54.3	58.9	54.0	52.7	58.4	57.0	56.4	56.6
% pirofanite	0.6	1.3	0.9	0.6	0.5	0.6	0.6	0.6	0.8

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	32A_l_098	22_a_067	60A_6a_060	60A_6a_061	60A_6a_062	60A_6a_063	60A_6a_064	65_1c_009	65_1c_010
Kimberlite	Cat-115	Cat-115	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info		recrist.	recrist.	recrist.	recrist.	recrist.	recrist.	recrist.	recrist.
analysed area	core	core	core	core	core	core	core	core	core
SiO_2	0.13	0.29	0.26	0.20	0.33	0.23	0.38	0.05	0.07
TiO_2	46.55	48.46	49.81	49.73	49.71	49.85	50.26	47.39	47.02
Al_2O_3	0.57	0.48	0.55	0.48	0.44	0.50	0.50	0.56	0.57
Nb_2O_5	0.31	0.21	0.13	0.17	0.25	0.13	0.20	0.07	0.18
ZrO_2	0.03	0.08	0.05	0.10	0.00	0.14	0.12	0.00	0.22
Cr_2O_3	0.70	1.07	0.29	0.23	0.29	0.30	0.32	0.46	0.46
Fe_2O_3	15.01	12.41	10.65	11.67	10.87	10.51	10.21	14.31	14.55
FeO	28.08	28.33	28.94	28.30	28.54	28.77	29.08	28.45	28.31
MnO	0.32	0.29	0.19	0.21	0.30	0.29	0.29	0.22	0.23
MgO	7.75	8.64	8.99	9.31	9.22	9.05	9.23	7.87	7.87
CaO	0.00	0.02	0.06	0.03	0.00	0.01	0.01	0.01	0.01
ZnO	0.00	0.07	0.00	0.08	0.11	0.00	0.07	0.02	0.03
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.17	0.10	0.06	0.00	0.01	0.14	0.05	0.04	0.10
sum	99.62	100.45	99.98	100.51	100.07	99.91	100.72	99.44	99.62
Si	0.003	0.007	0.006	0.005	0.008	0.006	0.009	0.001	0.002
Ti	0.843	0.878	0.902	0.901	0.900	0.903	0.910	0.858	0.852
Al	0.016	0.014	0.016	0.014	0.012	0.014	0.014	0.016	0.016
Nb	0.003	0.002	0.001	0.002	0.003	0.001	0.002	0.001	0.002
Zr	0.000	0.001	0.001	0.001	0.000	0.002	0.001	0.000	0.003
Cr	0.013	0.020	0.006	0.004	0.006	0.006	0.006	0.009	0.009
Fe^{3+}	0.272	0.225	0.193	0.211	0.197	0.190	0.185	0.259	0.264
Fe^{2+}	0.565	0.571	0.583	0.570	0.575	0.579	0.586	0.573	0.570
Mn	0.007	0.006	0.004	0.004	0.006	0.006	0.006	0.004	0.005
Mg	0.278	0.310	0.323	0.334	0.331	0.325	0.331	0.282	0.282
Ca	0.000	0.001	0.002	0.001	0.000	0.000	0.000	0.000	0.000
Zn	0.000	0.001	0.000	0.001	0.002	0.000	0.001	0.000	0.001
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.003	0.002	0.001	0.000	0.000	0.003	0.001	0.001	0.002
% geikielite	28.2	31.0	32.1	33.0	32.8	32.3	32.6	28.6	28.6
% hematites	13.8	11.3	9.6	10.4	9.8	9.5	9.1	13.1	13.3
% ilmenite	57.3	57.1	57.9	56.2	56.9	57.6	57.7	57.9	57.6
% pirofanite	0.7	0.6	0.4	0.4	0.6	0.6	0.6	0.5	0.5

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	65_1c_011	37_h_025	22_a_065	22_a_066	22_f_079	26_i_030	50_1b_098	50_1b_099	59-A4_b_067
Kimberlite	Tchiuzo	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115	Tchiuzo	Tchiuzo	Tchiuzo
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info	recrist.	recrist.	recrist.	recrist.	recrist.	recrist.	recrist.	recrist.	recrist.
analysed area	core	core	core	core	core	core	core	core	core
SiO_2	0.05	0.10	0.27	0.24	0.06	0.02	0.01	0.06	0.06
TiO_2	47.57	44.75	49.08	48.93	48.78	47.08	49.57	48.42	52.08
Al_2O_3	0.48	0.48	0.52	0.53	0.60	0.65	0.63	0.58	0.50
Nb_2O_5	0.00	0.38	0.15	0.22	0.27	0.27	0.24	0.11	0.26
ZrO_2	0.06	0.19	0.13	0.20	0.05	0.23	0.00	0.13	0.00
Cr_2O_3	0.44	0.70	0.99	1.04	1.07	0.96	2.19	2.13	0.49
Fe_2O_3	15.12	17.87	10.59	12.55	11.53	16.25	8.50	11.22	8.32
FeO	28.49	28.38	29.13	29.00	26.90	26.64	28.17	27.40	26.96
MnO	0.20	0.23	0.31	0.26	0.29	0.34	0.17	0.27	0.24
MgO	7.87	6.83	8.51	8.59	9.50	8.78	9.13	8.95	11.11
CaO	0.00	0.00	0.02	0.01	0.00	0.02	0.01	0.00	0.03
ZnO	0.03	0.05	0.00	0.00	0.03	0.03	0.00	0.01	0.00
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
NiO	0.14	0.07	0.08	0.07	0.12	0.12	0.24	0.19	0.16
sum	100.45	100.03	99.77	101.64	99.21	101.39	98.86	99.48	100.21
Si	0.001	0.002	0.007	0.006	0.001	0.000	0.000	0.001	0.001
Ti	0.862	0.811	0.889	0.886	0.884	0.853	0.898	0.877	0.943
Al	0.014	0.014	0.015	0.015	0.017	0.018	0.018	0.016	0.014
Nb	0.000	0.004	0.002	0.002	0.003	0.003	0.003	0.001	0.003
Zr	0.001	0.002	0.002	0.002	0.001	0.003	0.000	0.002	0.000
Cr	0.008	0.013	0.019	0.020	0.020	0.018	0.042	0.041	0.009
Fe^{3+}	0.274	0.324	0.192	0.227	0.209	0.294	0.154	0.203	0.151
Fe^{2+}	0.574	0.571	0.586	0.584	0.542	0.536	0.567	0.552	0.543
Mn	0.004	0.005	0.006	0.005	0.006	0.007	0.003	0.006	0.005
Mg	0.282	0.245	0.305	0.308	0.341	0.315	0.328	0.321	0.399
Ca	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.001
Zn	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.000
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.003	0.001	0.002	0.001	0.002	0.002	0.005	0.004	0.003
% geikielite	28.3	24.9	30.7	30.5	34.3	31.3	33.6	32.8	39.0
% hematites	13.7	16.5	9.6	11.2	10.5	14.6	7.9	10.4	7.4
% ilmenite	57.5	58.1	59.0	57.7	54.5	53.3	58.2	56.3	53.1
% pirofanite	0.4	0.5	0.6	0.5	0.6	0.7	0.4	0.6	0.5

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	59-A4_b_068	59-B4_a_029	59-B4_b_039	60A_3b_045	60A_3b_046	60A_3b_047	60A_4a_050	60A_4a_051	60A_4a_052
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info	recrist.	recrist.	recrist.	recrist.	recrist.	recrist.	recrist.	recrist.	recrist.
analysed area	core	core	core	core	core	core	core	core	core
SiO_2	0.07	0.00	0.04	0.20	0.25	0.12	0.34	0.21	0.37
TiO_2	52.00	45.35	49.17	48.18	47.92	48.38	51.08	50.85	50.77
Al_2O_3	0.58	0.46	0.58	0.53	0.51	0.49	0.43	0.52	0.49
Nb_2O_5	0.13	0.36	0.24	0.22	0.24	0.26	0.24	0.34	0.00
ZrO_2	0.03	0.16	0.12	0.12	0.04	0.05	0.00	0.13	0.04
Cr_2O_3	0.51	0.75	0.28	0.24	0.28	0.28	0.39	0.42	0.41
Fe_2O_3	8.93	16.81	14.10	13.52	13.32	12.97	8.99	9.80	9.85
FeO	25.79	28.55	24.89	28.97	28.44	29.01	28.66	28.36	28.34
MnO	0.33	0.26	0.32	0.30	0.28	0.24	0.24	0.30	0.18
MgO	11.58	6.88	10.82	8.07	8.31	8.21	9.89	9.92	9.82
CaO	0.06	0.02	0.02	0.02	0.04	0.00	0.00	0.02	0.00
ZnO	0.07	0.07	0.00	0.09	0.02	0.00	0.03	0.00	0.00
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.12	0.12	0.09	0.13	0.09	0.09	0.06	0.07	0.11
sum	100.19	99.78	100.66	100.58	99.73	100.10	100.35	100.94	100.39
Si	0.002	0.000	0.001	0.005	0.006	0.003	0.008	0.005	0.009
Ti	0.942	0.821	0.891	0.873	0.868	0.876	0.925	0.921	0.920
Al	0.016	0.013	0.016	0.015	0.014	0.014	0.012	0.015	0.014
Nb	0.001	0.004	0.003	0.002	0.003	0.003	0.003	0.004	0.000
Zr	0.000	0.002	0.001	0.001	0.000	0.001	0.000	0.002	0.000
Cr	0.010	0.014	0.005	0.005	0.005	0.005	0.007	0.008	0.008
Fe^{3+}	0.162	0.304	0.255	0.245	0.241	0.235	0.163	0.178	0.179
Fe^{2+}	0.519	0.575	0.501	0.583	0.573	0.584	0.577	0.571	0.571
Mn	0.007	0.005	0.007	0.006	0.006	0.005	0.005	0.006	0.004
Mg	0.416	0.247	0.388	0.290	0.298	0.295	0.355	0.356	0.352
Ca	0.002	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.000
Zn	0.001	0.001	0.000	0.002	0.000	0.000	0.001	0.000	0.000
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.002	0.002	0.002	0.003	0.002	0.002	0.001	0.001	0.002
% geikielite	40.6	25.2	37.9	28.9	29.9	29.4	34.9	34.8	34.7
% hematites	7.9	15.5	12.5	12.2	12.1	11.7	8.0	8.7	8.8
% ilmenite	50.8	58.7	48.9	58.2	57.4	58.3	56.7	55.9	56.2
% pirofanite	0.7	0.5	0.6	0.6	0.6	0.5	0.5	0.6	0.4

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	60A_6b_065	60A_6b_066	65_2c_020	65_2c_021	65_2c_022	65_3a_023	65_3a_026	65_3b_027	65_4a_030
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info	recrist.	recrist.	recrist.	recrist.	recrist.	recrist.	recrist.	recrist.	recrist.
analysed area	core	core	core	core	core	core	core	rim	core
SiO_2	0.19	0.32	0.06	0.07	0.12	0.03	0.08	0.01	0.09
TiO_2	50.38	50.21	47.53	47.10	48.14	47.06	47.52	47.32	47.56
Al_2O_3	0.47	0.55	0.55	0.49	0.58	0.57	0.53	0.52	0.47
Nb_2O_5	0.38	0.07	0.20	0.31	0.19	0.39	0.21	0.23	0.18
ZrO_2	0.18	0.00	0.21	0.21	0.00	0.08	0.00	0.05	0.13
Cr_2O_3	0.28	0.29	0.49	0.50	0.51	0.52	0.47	0.54	0.45
Fe_2O_3	9.42	10.24	14.31	14.32	14.65	15.00	14.50	14.68	14.02
FeO	28.75	28.44	28.01	28.93	26.92	28.70	28.58	28.51	28.66
MnO	0.29	0.22	0.30	0.26	0.76	0.26	0.24	0.53	0.23
MgO	9.46	9.42	8.23	7.61	8.86	7.74	7.91	7.71	7.91
CaO	0.05	0.04	0.00	0.00	0.02	0.01	0.00	0.00	0.00
ZnO	0.04	0.07	0.10	0.08	0.06	0.00	0.07	0.00	0.15
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.06	0.06	0.10	0.08	0.10	0.07	0.09	0.07	0.04
sum	99.95	99.93	100.08	99.96	100.91	100.42	100.20	100.17	99.88
Si	0.005	0.008	0.001	0.002	0.003	0.001	0.002	0.000	0.002
Ti	0.912	0.909	0.861	0.853	0.872	0.852	0.861	0.857	0.861
Al	0.013	0.016	0.016	0.014	0.016	0.016	0.015	0.015	0.013
Nb	0.004	0.001	0.002	0.003	0.002	0.004	0.002	0.003	0.002
Zr	0.002	0.000	0.002	0.002	0.000	0.001	0.000	0.001	0.002
Cr	0.005	0.006	0.009	0.010	0.010	0.010	0.009	0.010	0.009
Fe^{3+}	0.171	0.185	0.259	0.259	0.265	0.272	0.263	0.266	0.254
Fe^{2+}	0.579	0.573	0.564	0.583	0.542	0.578	0.575	0.574	0.577
Mn	0.006	0.004	0.006	0.005	0.015	0.005	0.005	0.011	0.005
Mg	0.340	0.338	0.295	0.273	0.318	0.278	0.284	0.277	0.284
Ca	0.001	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000
Zn	0.001	0.001	0.002	0.001	0.001	0.000	0.001	0.000	0.003
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.001	0.001	0.002	0.002	0.002	0.001	0.002	0.001	0.001
% geikielite	33.6	33.5	29.7	27.6	31.5	27.9	28.5	27.8	28.6
% hematites	8.5	9.2	13.0	13.1	13.2	13.6	13.2	13.4	12.8
% ilmenite	57.3	56.8	56.7	58.8	53.8	58.0	57.8	57.7	58.1
% pirofanite	0.6	0.4	0.6	0.5	1.5	0.5	0.5	1.1	0.5

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	65_4a_031	510-67.3a_a_125	510-67.3a_a_126	10-67.3a_a_12	7c_c_083	7c_c_084	7c_c_085	7c_c_086	7c_c_087
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info	recrist.	recrist.	recrist.	recrist.	with chr	with chr	with chr	with chr	with chr
analysed area	core	core	core		core	med	med	rim1	rim2
SiO_2	0.03	0.06	0.03	1.94	0.00	0.03	0.02	0.02	0.33
TiO_2	47.55	52.26	51.65	50.35	48.60	48.51	48.27	49.45	49.18
Al_2O_3	0.55	0.63	0.55	0.77	0.26	0.28	0.30	0.33	0.20
Nb_2O_5	0.26	0.10	0.04	0.04	0.00	0.09	0.01	0.10	0.08
ZrO_2	0.10	0.00	0.06	0.00	0.05	0.13	0.14	0.23	0.00
Cr_2O_3	0.44	0.53	0.55	0.51	2.65	2.76	2.53	1.68	0.61
Fe_2O_3	14.63	9.20	8.80	3.24	8.78	10.03	10.34	9.39	18.17
FeO	28.24	26.65	26.95	28.39	28.32	25.47	26.72	24.77	11.61
MnO	0.27	0.44	0.31	0.82	1.60	1.88	1.65	1.88	1.49
MgO	8.15	11.11	10.76	10.19	7.65	9.17	8.39	10.03	17.44
CaO	0.01	0.04	0.00	0.15	0.10	0.08	0.09	0.08	0.25
ZnO	0.04	0.11	0.01	0.00	0.01	0.00	0.09	0.04	0.10
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.06	0.15	0.13	0.08	0.04	0.03	0.00	0.06	0.11
sum	100.34	101.28	99.84	96.48	98.06	98.45	98.55	98.06	99.57
Si	0.001	0.001	0.001	0.047	0.000	0.001	0.000	0.000	0.008
Ti	0.861	0.947	0.935	0.912	0.880	0.879	0.874	0.896	0.891
Al	0.016	0.018	0.016	0.022	0.007	0.008	0.009	0.009	0.006
Nb	0.003	0.001	0.000	0.000	0.000	0.001	0.000	0.001	0.001
Zr	0.001	0.000	0.001	0.000	0.001	0.002	0.002	0.003	0.000
Cr	0.008	0.010	0.010	0.010	0.050	0.053	0.048	0.032	0.012
Fe^{3+}	0.265	0.167	0.159	0.059	0.159	0.182	0.187	0.170	0.329
Fe^{2+}	0.569	0.537	0.543	0.572	0.570	0.513	0.538	0.499	0.234
Mn	0.006	0.009	0.006	0.017	0.033	0.038	0.034	0.038	0.030
Mg	0.293	0.399	0.386	0.366	0.275	0.329	0.301	0.360	0.626
Ca	0.000	0.001	0.000	0.004	0.003	0.002	0.002	0.002	0.006
Zn	0.001	0.002	0.000	0.000	0.000	0.000	0.002	0.001	0.002
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.001	0.003	0.003	0.002	0.001	0.001	0.000	0.001	0.002
% geikielite	29.3	38.8	38.1	37.2	28.7	33.9	31.2	36.7	59.3
% hematites	13.3	8.1	7.9	3.0	8.3	9.4	9.7	8.7	15.6
% ilmenite	56.9	52.2	53.5	58.1	59.6	52.8	55.7	50.8	22.2
% pirofanite	0.6	0.9	0.6	1.7	3.4	3.9	3.5	3.9	2.9

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	7c_c_090	7c_c_091	7c_c_092	7c_c_093	7c_c_098	7c_c_103	7c_c_104	7c_c_105	7c_c_106
Kimberlite	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info	with chr	with chr	with chr	with chr	with chr	with chr	with chr	with chr	with chr
analysed area	core	med	med	rim1	core	core	med	med	rim1
SiO_2	0.05	0.02	0.11	0.82	0.13	0.07	0.01	0.01	0.26
TiO_2	48.75	51.47	52.22	45.94	54.58	48.77	48.73	48.06	52.82
Al_2O_3	0.36	0.27	0.23	0.17	0.19	0.30	0.30	0.30	0.18
Nb_2O_5	0.06	0.10	0.01	0.03	0.11	0.06	0.03	0.02	0.01
ZrO_2	0.09	0.20	0.20	0.10	0.03	0.11	0.15	0.22	0.10
Cr_2O_3	1.94	1.09	0.68	0.29	0.88	2.75	2.64	2.10	0.75
Fe_2O_3	6.79	3.25	3.54	27.68	10.23	4.30	5.38	4.45	6.30
FeO	29.30	30.55	24.50	3.47	14.42	31.31	30.08	33.46	19.50
MnO	1.60	2.19	2.07	1.94	1.82	1.15	1.20	1.46	2.18
MgO	7.14	7.59	11.47	20.50	18.50	6.46	7.03	4.67	14.58
CaO	0.23	0.11	0.11	0.32	0.07	0.03	0.03	0.03	0.11
ZnO	0.03	0.12	0.06	0.01	0.07	0.05	0.01	0.00	0.00
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.06	0.00	0.00	0.00	0.00	0.01	0.10	0.10	0.06
sum	96.40	96.97	95.19	101.27	101.02	95.37	95.69	94.88	96.85
Si	0.001	0.000	0.003	0.020	0.003	0.002	0.000	0.000	0.006
Ti	0.883	0.932	0.946	0.832	0.989	0.883	0.883	0.870	0.957
Al	0.010	0.008	0.007	0.005	0.005	0.009	0.009	0.009	0.005
Nb	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.000
Zr	0.001	0.002	0.002	0.001	0.000	0.001	0.002	0.003	0.001
Cr	0.037	0.021	0.013	0.006	0.017	0.052	0.050	0.040	0.014
Fe^{3+}	0.123	0.059	0.064	0.502	0.185	0.078	0.097	0.081	0.114
Fe^{2+}	0.590	0.615	0.493	0.070	0.290	0.630	0.606	0.674	0.393
Mn	0.033	0.045	0.042	0.040	0.037	0.023	0.024	0.030	0.044
Mg	0.256	0.272	0.412	0.736	0.664	0.232	0.252	0.168	0.523
Ca	0.006	0.003	0.003	0.008	0.002	0.001	0.001	0.001	0.003
Zn	0.001	0.002	0.001	0.000	0.001	0.001	0.000	0.000	0.000
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.001	0.000	0.000	0.000	0.000	0.000	0.002	0.002	0.001
% geikielite	27.3	28.3	42.0	67.1	61.3	25.1	27.1	18.4	51.4
% hematites	6.5	3.1	3.3	22.9	8.5	4.2	5.2	4.4	5.6
% ilmenite	62.7	64.0	50.4	6.4	26.8	68.2	65.0	73.9	38.6
% pirofanite	3.5	4.6	4.3	3.6	3.4	2.5	2.6	3.3	4.4

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	7c_c_107	7c_c_119	7c_c_120	7c_c_121	7c_d_124	7c_d_125	7c_d_126	7c_f_114	7c_f_115
Kimberlite	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1	Lucapa 1
compositional group	3	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info	with chr	with chr	with chr	with chr	with chr	with chr	with chr	with chr	with chr
analysed area	rim2	core	med	rim1	core	med	rim1	rim	core
SiO_2	0.41	0.00	0.03	0.53	0.03	0.05	0.98	0.20	0.07
TiO_2	51.98	48.89	48.64	50.02	49.81	49.67	44.17	50.07	49.48
Al_2O_3	0.20	0.31	0.29	0.20	0.32	0.28	0.14	0.47	0.33
Nb_2O_5	0.14	0.00	0.00	0.12	0.00	0.10	0.10	0.01	0.00
ZrO_2	0.02	0.06	0.17	0.09	0.01	0.29	0.11	0.11	0.02
Cr_2O_3	0.83	3.30	2.30	0.62	1.49	1.14	0.24	1.90	1.96
Fe_2O_3	7.64	10.99	9.61	12.71	8.33	6.27	27.28	5.46	6.10
FeO	16.20	25.34	29.38	17.73	27.34	30.26	0.83	24.34	31.33
MnO	2.53	1.14	1.09	1.30	1.37	1.75	9.23	1.05	0.77
MgO	15.95	9.76	7.47	14.89	8.95	7.16	16.99	10.61	6.52
CaO	0.12	0.05	0.06	0.13	0.10	0.11	0.37	0.80	0.66
ZnO	0.01	0.03	0.01	0.04	0.05	0.04	0.11	0.00	0.01
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.06	0.03	0.00	0.02	0.00	0.05	0.04	0.01	0.02
sum	96.09	99.90	99.05	98.40	97.79	97.17	100.59	95.04	97.27
Si	0.010	0.000	0.001	0.013	0.001	0.001	0.024	0.005	0.002
Ti	0.941	0.886	0.881	0.906	0.902	0.900	0.800	0.907	0.896
Al	0.006	0.009	0.008	0.006	0.009	0.008	0.004	0.013	0.009
Nb	0.002	0.000	0.000	0.001	0.000	0.001	0.001	0.000	0.000
Zr	0.000	0.001	0.002	0.001	0.000	0.003	0.001	0.001	0.000
Cr	0.016	0.063	0.044	0.012	0.028	0.022	0.005	0.036	0.037
Fe^{3+}	0.138	0.199	0.174	0.230	0.151	0.114	0.494	0.099	0.111
Fe^{2+}	0.326	0.510	0.592	0.357	0.550	0.609	0.017	0.490	0.631
Mn	0.052	0.023	0.022	0.027	0.028	0.036	0.188	0.021	0.016
Mg	0.572	0.350	0.268	0.534	0.321	0.257	0.610	0.381	0.234
Ca	0.003	0.001	0.002	0.003	0.003	0.003	0.010	0.021	0.017
Zn	0.000	0.001	0.000	0.001	0.001	0.001	0.002	0.000	0.000
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.001	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000
% geikielite	56.2	35.6	27.7	51.7	32.9	26.8	57.4	40.4	25.0
% hematites	6.8	10.1	9.0	11.1	7.7	5.9	23.3	5.3	5.9
% ilmenite	32.0	51.9	61.1	34.6	56.5	63.5	1.6	52.0	67.4
% pirofanite	5.1	2.4	2.3	2.6	2.9	3.7	17.7	2.3	1.7

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	32A_i_094	32A_i_095	6A(2)_a_085	6A(2)_a_086	6A(2)_x_092	6A(2)_z4_108	6A(2)_z4_110	6A_a_034	6A_a_035
Kimberlite	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115
compositional group	3	3	3	3	3	3	3	3	3
Texture	sympl	sympl	sympl	sympl	sympl	sympl	sympl	sympl	sympl
extra info									
analysed area	core	core	core	rim	core	core	core	core	core
SiO_2	0.07	0.03	0.03	0.00	0.10	0.01	0.00	0.03	0.04
TiO_2	47.82	45.78	50.58	50.33	54.58	52.08	52.01	51.76	53.73
Al_2O_3	0.76	0.83	0.73	0.77	0.61	0.48	0.67	0.84	0.70
Nb_2O_5	0.00	0.28	0.40	0.43	0.18	0.08	0.36	0.12	0.20
ZrO_2	0.19	0.15	0.15	0.31	0.07	0.15	0.06	0.20	0.16
Cr_2O_3	1.20	1.18	1.07	1.03	0.99	0.52	2.18	1.12	1.26
Fe_2O_3	15.69	18.37	9.16	9.04	5.08	9.41	8.51	9.93	6.85
FeO	22.25	22.35	26.38	26.13	21.20	24.93	19.93	21.15	21.57
MnO	0.34	0.40	0.89	0.59	3.10	4.47	2.47	1.94	1.20
MgO	11.44	10.51	10.43	10.57	13.89	9.70	13.76	13.16	14.41
CaO	0.05	0.06	0.07	0.08	0.15	0.15	0.13	0.12	0.11
ZnO	0.04	0.00	0.02	0.11	0.06	0.04	0.04	0.00	0.03
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
NiO	0.13	0.04	0.08	0.16	0.11	0.06	0.05	0.12	0.05
sum	99.98	99.98	99.99	99.55	100.12	102.08	100.17	100.50	100.33
Si	0.002	0.001	0.001	0.000	0.002	0.000	0.000	0.001	0.001
Ti	0.866	0.829	0.916	0.912	0.989	0.943	0.942	0.937	0.973
Al	0.022	0.024	0.021	0.022	0.017	0.014	0.019	0.024	0.020
Nb	0.000	0.003	0.004	0.005	0.002	0.001	0.004	0.001	0.002
Zr	0.002	0.002	0.002	0.004	0.001	0.002	0.001	0.002	0.002
Cr	0.023	0.022	0.020	0.020	0.019	0.010	0.041	0.021	0.024
Fe^{3+}	0.284	0.333	0.166	0.164	0.092	0.170	0.154	0.180	0.124
Fe^{2+}	0.448	0.450	0.531	0.526	0.427	0.502	0.401	0.426	0.434
Mn	0.007	0.008	0.018	0.012	0.063	0.091	0.050	0.040	0.024
Mg	0.411	0.377	0.374	0.379	0.499	0.348	0.494	0.472	0.517
Ca	0.001	0.002	0.002	0.002	0.004	0.004	0.003	0.003	0.003
Zn	0.001	0.000	0.000	0.002	0.001	0.001	0.001	0.000	0.001
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.003	0.001	0.002	0.003	0.002	0.001	0.001	0.002	0.001
% geikielite	40.7	37.7	37.2	38.0	48.2	33.9	48.3	46.0	49.8
% hematites	14.1	16.6	8.2	8.2	4.4	8.3	7.5	8.8	6.0
% ilmenite	44.5	44.9	52.8	52.6	41.3	48.9	39.2	41.4	41.8
% pirofanite	0.7	0.8	1.8	1.2	6.1	8.9	4.9	3.8	2.4

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	6A_d_045	6A_d_050	6A3-a_029	6A3-a_030	6A3-a_031	6A3-a_032	6A3-a_033	6A3-d_034	6A3-d_035
Kimberlite	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115
compositional group	3	3	3	3	3	3	3	3	3
Texture	sympl	sympl	sympl	sympl	sympl	sympl	sympl	sympl	sympl
extra info									
analysed area	core	core	rim	med	core	core	rim	core	rim
SiO_2	0.01	0.07	0.00	0.02	0.06	0.00	0.04	0.04	0.03
TiO_2	53.47	47.61	55.15	51.83	49.96	50.28	54.98	54.45	53.11
Al_2O_3	0.55	1.81	0.54	0.73	0.79	0.72	0.57	0.65	0.72
Nb_2O_5	0.12	0.65	0.55	0.17	0.22	0.23	0.16	0.42	0.05
ZrO_2	0.28	0.29	0.15	0.25	0.34	0.19	0.20	0.13	0.11
Cr_2O_3	1.50	1.39	0.67	0.98	1.02	1.07	0.55	1.57	2.28
Fe_2O_3	6.61	15.75	7.59	8.97	11.01	11.53	8.08	1.99	7.64
FeO	19.25	14.80	19.95	24.33	24.61	23.48	18.89	23.28	19.39
MnO	3.41	2.30	1.34	1.07	0.70	1.18	1.25	3.01	2.82
MgO	14.32	14.79	16.14	12.00	11.15	11.58	16.51	12.84	14.27
CaO	0.10	0.15	0.12	0.08	0.08	0.08	0.14	0.11	0.11
ZnO	0.00	0.00	0.00	0.04	0.06	0.05	0.00	0.17	0.10
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.05	0.10	0.06	0.04	0.10	0.13	0.03	0.05	0.02
sum	99.67	99.71	102.26	100.51	100.10	100.53	101.40	98.71	100.65
Si	0.000	0.002	0.000	0.000	0.001	0.000	0.001	0.001	0.001
Ti	0.968	0.862	0.999	0.939	0.905	0.911	0.996	0.986	0.962
Al	0.016	0.051	0.015	0.021	0.022	0.020	0.016	0.018	0.020
Nb	0.001	0.007	0.006	0.002	0.002	0.003	0.002	0.005	0.001
Zr	0.003	0.003	0.002	0.003	0.004	0.002	0.002	0.002	0.001
Cr	0.029	0.026	0.013	0.019	0.019	0.020	0.010	0.030	0.043
Fe^{3+}	0.120	0.285	0.137	0.163	0.199	0.209	0.146	0.036	0.138
Fe^{2+}	0.388	0.298	0.402	0.490	0.496	0.473	0.380	0.469	0.390
Mn	0.070	0.047	0.027	0.022	0.014	0.024	0.025	0.061	0.058
Mg	0.514	0.531	0.579	0.431	0.400	0.416	0.593	0.461	0.512
Ca	0.003	0.004	0.003	0.002	0.002	0.002	0.004	0.003	0.003
Zn	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.003	0.002
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.001	0.002	0.001	0.001	0.002	0.003	0.001	0.001	0.000
% geikielite	49.9	52.1	53.8	42.1	39.6	40.9	55.3	45.7	49.8
% hematites	5.8	14.0	6.4	7.9	9.9	10.3	6.8	1.8	6.7
% ilmenite	37.6	29.3	37.3	47.9	49.1	46.5	35.5	46.5	37.9
% pirofanite	6.7	4.6	2.5	2.1	1.4	2.4	2.4	6.1	5.6

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	6A3-d_037	6A3-z_042	6A3-z_043	6A3-z_044	6A3-z_045	618-267a_c_148	618-267a_c_149	618-47_g_117	618-47_g_118
Kimberlite	Cat-115	Cat-115	Cat-115	Cat-115	Cat-115	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
compositional group	3	3	3	3	3	3	3	4	4
Texture	sympl	sympl	sympl	sympl	sympl	sympl	sympl	tabular	tabular
extra info									
analysed area	core	core	core	core	core	core	core	core	core
SiO_2	0.01	0.03	0.07	0.03	0.11	0.02	0.04	0.02	0.02
TiO_2	42.88	51.22	48.86	49.59	54.25	46.32	48.95	50.55	49.67
Al_2O_3	2.00	0.76	1.08	0.99	0.71	1.00	0.74	0.05	0.06
Nb_2O_5	0.69	0.23	0.32	0.26	0.08	0.35	0.11	0.17	0.22
ZrO_2	0.73	0.15	0.28	0.20	0.20	0.21	0.44	0.00	0.00
Cr_2O_3	1.72	3.22	3.63	3.19	1.88	6.15	4.09	0.12	0.09
Fe_2O_3	19.59	7.67	7.40	9.38	8.95	13.91	12.00	2.05	3.00
FeO	21.29	21.32	26.51	25.06	17.32	18.95	20.20	15.92	6.45
MnO	0.43	1.94	0.75	0.96	1.07	0.38	0.42	29.10	37.78
MgO	10.04	12.86	9.58	10.62	17.08	12.65	13.24	0.08	0.08
CaO	0.08	0.13	0.08	0.06	0.09	0.15	0.12	0.04	0.07
ZnO	0.00	0.04	0.06	0.00	0.06	0.03	0.00	0.03	0.00
V_2O_3	0.23	0.00	0.00	0.00	0.00	0.14	0.03	0.00	0.00
NiO	0.03	0.04	0.05	0.00	0.12	0.09	0.08	0.07	0.00
sum	99.72	99.61	98.66	100.34	101.93	100.35	100.46	98.21	97.44
Si	0.000	0.001	0.002	0.001	0.003	0.000	0.001	0.000	0.000
Ti	0.777	0.928	0.885	0.898	0.983	0.839	0.887	0.916	0.900
Al	0.057	0.022	0.031	0.028	0.020	0.028	0.021	0.001	0.002
Nb	0.008	0.003	0.003	0.003	0.001	0.004	0.001	0.002	0.002
Zr	0.009	0.002	0.003	0.002	0.002	0.002	0.005	0.000	0.000
Cr	0.033	0.061	0.069	0.061	0.036	0.117	0.078	0.002	0.002
Fe^{3+}	0.355	0.139	0.134	0.170	0.162	0.252	0.217	0.037	0.054
Fe^{2+}	0.429	0.429	0.534	0.505	0.349	0.382	0.407	0.321	0.130
Mn	0.009	0.040	0.015	0.020	0.022	0.008	0.009	0.593	0.770
Mg	0.360	0.462	0.344	0.381	0.613	0.454	0.475	0.003	0.003
Ca	0.002	0.003	0.002	0.002	0.002	0.004	0.003	0.001	0.002
Zn	0.000	0.001	0.001	0.000	0.001	0.001	0.000	0.001	0.000
V	0.002	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
Ni	0.001	0.001	0.001	0.000	0.002	0.002	0.002	0.001	0.000
% geikielite	36.9	46.2	35.8	38.5	57.6	46.8	47.6	0.3	0.3
% hematites	18.2	6.9	7.0	8.6	7.6	13.0	10.9	2.0	2.9
% ilmenite	44.0	42.9	55.6	51.0	32.8	39.4	40.7	34.3	14.0
% pirofanite	0.9	4.0	1.6	2.0	2.0	0.8	0.9	63.4	82.8

A9.1. Major-element compositon of ilmenite in the Cat115, Tchiuzo and Lucapa 1 kimberlites. Oxides in wt%. Structural formula normalised to 3 oxygens

Label	59-B3_a_014	59-B3_a_015	59-A2_a_048	59-A2_a_051	59-A2_a_052	618-47_d_102	618-47_e_107	618-47_h_120	618-47_h_121
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
compositional group	4	4	4	4	4	4	4	4	4
Texture	nodule	nodule	nodule	nodule	nodule	Mn-rich secondary	Mn-rich secondary	Mn-rich secondary	Mn-rich secondary
extra info	Mn-rich	Mn-rich	Mn-rich	Mn-rich	Mn-rich				
analysed area	rim	rim	core	core	core	core	core	core	core
SiO_2	0.15	0.17	0.00	0.03	0.00	0.01	0.03	0.02	0.03
TiO_2	47.62	49.12	54.40	53.17	52.97	51.11	51.03	51.50	51.91
Al_2O_3	0.49	0.50	0.47	0.56	0.52	0.05	0.06	0.06	0.04
Nb_2O_5	0.32	0.22	0.17	0.11	0.13	0.23	0.14	0.27	0.14
ZrO_2	0.20	0.12	0.00	0.16	0.01	0.00	0.00	0.02	0.09
Cr_2O_3	0.91	0.90	0.60	0.50	0.28	0.08	0.06	0.02	0.05
Fe_2O_3	10.89	1.79	6.89	5.88	7.54	2.31	2.10	2.49	0.23
FeO	27.12	34.85	18.33	19.37	23.41	29.39	24.33	3.57	4.52
MnO	2.52	2.05	5.78	9.50	3.54	16.42	21.05	41.76	40.93
MgO	7.63	4.29	13.81	10.50	11.56	0.10	0.08	0.34	0.23
CaO	0.03	0.06	0.11	0.11	0.10	0.02	0.21	0.12	0.39
ZnO	0.10	0.00	0.06	0.05	0.00	0.01	0.00	0.04	0.04
V_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NiO	0.08	0.05	0.13	0.19	0.07	0.00	0.03	0.00	0.02
sum	98.06	94.12	100.75	100.13	100.13	99.73	99.12	100.21	98.62
Si	0.004	0.004	0.000	0.001	0.000	0.000	0.001	0.000	0.001
Ti	0.863	0.890	0.985	0.963	0.959	0.926	0.924	0.933	0.940
Al	0.014	0.014	0.013	0.016	0.015	0.001	0.002	0.002	0.001
Nb	0.003	0.002	0.002	0.001	0.001	0.003	0.002	0.003	0.002
Zr	0.002	0.001	0.000	0.002	0.000	0.000	0.000	0.000	0.001
Cr	0.017	0.017	0.011	0.010	0.005	0.002	0.001	0.000	0.001
Fe^{3+}	0.197	0.032	0.125	0.106	0.137	0.042	0.038	0.045	0.004
Fe^{2+}	0.546	0.702	0.369	0.390	0.471	0.592	0.490	0.072	0.091
Mn	0.051	0.042	0.118	0.194	0.072	0.335	0.429	0.852	0.835
Mg	0.274	0.154	0.496	0.377	0.415	0.004	0.003	0.012	0.008
Ca	0.001	0.002	0.003	0.003	0.003	0.001	0.005	0.003	0.010
Zn	0.002	0.000	0.001	0.001	0.000	0.000	0.000	0.001	0.001
V	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	0.002	0.001	0.003	0.004	0.001	0.000	0.001	0.000	0.000
% geikielite	28.2	16.9	47.4	37.2	40.4	0.4	0.3	1.3	0.9
% hematites	10.2	1.8	6.0	5.3	6.6	2.2	2.0	2.4	0.2
% ilmenite	56.3	76.8	35.3	38.5	45.9	62.2	52.1	7.5	9.7
% pirofanite	5.3	4.6	11.3	19.1	7.0	35.2	45.6	88.9	89.2

A9.2. Trace element analyses of ilmenite (in ppm). NA stands for not analysed and bdl for analyses below detection limit

Sample	35_b_036	35_c_040	35_c_041	35_d_042	35_f_049	35_h_055	35_h_056	42_b_155
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Compositional group	1	1	1	1	1	1	1	1
Texture	granulite	granulite	granulite	granulite	granulite	granulite	granulite	met. 1
extra info								
Sc	16.37	12.94	13.41	10.23	bdl	9.23	9.02	17.69
V	3280	3510	3270	3270	5390	3690	3770	2090
Cr	660	861	606	709	1780	873	877	5560
Mn	1083	1614	1949	862	1217	847	776	2480
Co	158.7	166.0	166.8	181.0	175.6	161.1	150.4	195.0
Ni	217	234	182.5	255	267	386	374	631
Zn	760	810	716	863	366	878	810	306
Ga	13.54	17.60	12.72	21.5	32.4	20.9	21.4	4.66
Zr	bdl	4.69	bdl	bdl	bdl	1.920	1.930	bdl
Nb	109.9	122.5	54.3	122.1	121.4	122.8	120.7	67.5
Hf	bdl	0.410	bdl	bdl	bdl	bdl	bdl	bdl
Ta	4.44	5.94	1.530	6.32	6.33	5.23	5.46	1.880
U	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
W	0.1500	0.337	bdl	0.435	bdl	0.346	0.329	bdl
Nb/Ta	24.8	20.6	35.5	19.32	19.18	23.5	22.1	35.9
Zr/Nb	0.00	0.0383	0.00	0.00	0.00	0.01564	0.01599	0.00
Zr/Hf	-	11.44	-	-	-	-	-	-

Sample	59-A2_a_053	59-A3_a_060	59-A4_a_063	59-A4_b_074	59-A4_b_074	59-A4_b_074	59-A4_b_074	59-A4_b_074
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
Compositional group	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info	recryst.	recryst.	recryst.	recryst.	recryst.	recryst.	recryst.	recryst.
Sc	18.18	15.98	17.06	15.08	15.13	15.08	15.01	15.05
V	1262	1177	1191	1249	1218	1221	1230	1215
Cr	1157	2370	2550	5850	5710	5850	5750	5760
Mn	2030	1931	2160	1804	1749	1765	1762	1782
Co	145.1	152.1	163.9	174.9	164.3	167.2	168.0	173.1
Ni	365	552	677	1073	1026	1031	1031	1039
Zn	195.2	182.4	181.7	173.5	170.4	168.1	173.4	170.4
Ga	13.33	12.86	12.30	12.73	12.49	12.39	12.58	12.37
Zr	340	275	286	171.5	171.6	169.6	164.5	173.5
Nb	1121	893	959	352	355	347	344	347
Hf	12.43	10.84	10.64	6.07	6.37	6.30	6.20	6.38
Ta	136.8	120.6	135.6	43.0	44.5	42.9	42.9	44.4
U	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
W	0.221	0.1830	0.1830	0.1260	0.1240	0.1230	0.1190	0.1320
Nb/Ta	8.19	7.40	7.07	8.19	7.98	8.08	8.01	7.82
Zr/Nb	0.303	0.308	0.299	0.487	0.483	0.489	0.479	0.500
Zr/Hf	27.3	25.4	26.9	28.3	26.9	26.9	26.5	27.2

Abbreviations: Compositional groups: **1.** Ilmenite sensu strictu; **2.** Fe^{3+}-rich ilmenite; **3.** Mg-rich ilmenite and **4.** Mn-rich ilmenite**.** Textures: **met.1** = metasomatic ilmenite (with apatite, clinopyroxene and amphibole); **met.2** = metasomatic ilmenite (veinlets in peridotites); **exsol** = ilmenite with hematite exsolutions; **sympl** = symplectitic ilmenite; **Mg-rich** = Mg enrichment in ilmenites,usually already rich in Mg (darker areas in BSE images); **recrist.** = ilmenite nodules showing recristallisation; **with Chr** = ilmenite nodules surrounding chromite and with inclusions

A9.2. Trace element analyses of ilmenite (in ppm). NA stands for not analysed and bdl for analyses below detection limit

Sample	42_b_156	42_h_169	50_2a_107	618-47_g_110	618-47_c_093	26_f_017	31_e_088	31_e_088
Kimberlite	Cat 115	Cat 115	Tchiuzo	Tchiuzo	Tchiuzo	Cat 115	Cat 115	Cat 115
Compositional group	3	1	1	1	1	2	2	2
Texture	met. 1	nodule	nodule	nodule	nodule	exsol	exsol	exsol
extra info								
Sc	20.2	24.5	24.1	23.8	25.2	49.8	29.2	27.9
V	2720	2060	1292	2070	1949	3910	1904	1865
Cr	5660	9300	4580	8510	7140	24700	3390	3400
Mn	2210	1430	1486	1590	1528	2630	1070	1033
Co	164.0	121.0	114.2	133.0	127.3	149.4	98.9	99.9
Ni	590	305	238	354	329	260	144.2	152.3
Zn	160.0	141.0	191.4	159.0	145.0	263	143.9	138.9
Ga	3.46	19.50	13.59	18.00	16.30	37.0	20.2	20.1
Zr	18.20	1210	982	835	780	3340	1671	1628
Nb	52.7	2170	1849	2150	2110	4250	2340	2280
Hf	2.15	44.4	30.6	48.1	44.8	116.0	55.7	55.6
Ta	1.610	bdl	190.1	377	374	469	247	245
U	bdl	bdl	0.1092	bdl	bdl	0.319	0.326	0.290
W	bdl	bdl	0.479	bdl	bdl	0.314	0.322	0.326
Nb/Ta	32.7	-	9.73	5.70	5.64	9.06	9.47	9.31
Zr/Nb	0.345	0.558	0.531	0.388	0.370	0.787	0.714	0.714
Zr/Hf	8.47	27.3	32.1	17.36	17.41	28.8	30.0	29.3

Sample	60A_3b_047	60A_3b_047	60A_4a_052	60A_6a_062	65_1c_010	65_2b_017	65_2b_017	65_3a_023
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
Compositional group	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info	recryst.	recryst.	recryst.	recryst.	recryst.	recryst.	recryst.	recryst.
Sc	19.94	18.74	15.26	16.59	19.44	19.81	19.24	20.2
V	1406	1420	1281	1371	1358	1328	1358	1361
Cr	1435	1464	2330	1632	3320	3460	3370	2120
Mn	2090	2170	2180	2180	1965	2080	1900	2150
Co	145.1	150.9	162.6	167.3	142.9	146.7	152.7	149.1
Ni	344	343	600	467	430	450	479	466
Zn	230	227	234	252	221	211	182.9	216
Ga	16.84	16.45	14.24	16.51	16.96	16.93	17.24	16.70
Zr	424	405	240	314	474	483	473	483
Nb	1308	1237	774	1035	1543	1562	1562	1534
Hf	15.95	15.89	9.80	11.87	16.90	17.49	16.94	17.49
Ta	160.4	164.4	104.7	130.0	196.1	206	203	199.5
U	bdl	bdl	bdl	bdl	0.0542	0.0380	0.0506	0.0518
W	0.261	0.252	bdl	bdl	0.271	0.264	0.248	0.222
Nb/Ta	8.15	7.52	7.39	7.96	7.87	7.58	7.71	7.69
Zr/Nb	0.324	0.327	0.310	0.303	0.307	0.309	0.303	0.315
Zr/Hf	26.6	25.5	24.5	26.5	28.0	27.6	27.9	27.6

A9.2. Trace element analyses of ilmenite (in ppm). NA stands for not analysed and bdl for analyses below detection limit

Sample	32A_i_090	32A_i_090	34_a_006	34_a_006	42-f_024	42-f_024	42-f_025	6A(2)_z4_113
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Compositional group	2	2	2	2	2	2	2	2
Texture	exsol	exsol	exsol	exsol	exsol	exsol	exsol	exsol
extra info								
Sc	bdl	28.9	53.5	52.9	bdl	bdl	25.9	57.3
V	2680	2370	3820	3960	2380	2390	2180	3080
Cr	12100	11380	10000	10340	8060	8210	7070	3600
Mn	1120	1148	1544	1595	1182	1013	1180	2300
Co	?	108.0	147.1	154.5	123.0	110.3	106.0	147.2
Ni	?	225	257	260	327	268	265	140.3
Zn	?	138.0	219	225	bdl	177.0	110.0	189.0
Ga	?	22.4	31.1	33.6	29.5	0.00	21.0	27.9
Zr	?	1780	2860	2960	2170	1990	1410	3510
Nb	2730	2690	3920	4030	2500	2420	1810	4670
Hf	bdl	68.6	92.4	96.0	74.7	69.9	55.2	134.0
Ta	302	317	403	414	273	246	225	560
U	bdl	bdl	0.475	0.505	bdl	bdl	bdl	bdl
W	bdl	bdl	0.475	0.557	bdl	bdl	bdl	bdl
Nb/Ta	9.04	8.49	9.73	9.73	9.16	9.84	8.04	8.34
Zr/Nb	0.00	0.662	0.729	0.734	0.868	0.822	0.779	0.752
Zr/Hf	-	25.9	30.9	30.8	29.0	28.5	25.5	26.2

Sample	65_4a_030	610-67.3a_a_125	610-67.3a_a_125	610-67.3a_a_126	610-67.3a_b_131	610-67.3a_b_131	610-67.3a_b_133	22_b_068
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Cat 115
Compositional group	3	3	3	3	3	3	3	3
Texture	nodule recryst.	nodule recryst.	nodule recryst.	nodule recryst.	nodule recryst.	nodule recryst.	nodule recryst.	nodule
extra info								
Sc	17.97	15.28	15.61	15.40	25.1	25.3	25.5	17.70
V	1398	1200	1213	1177	1446	1460	1441	1238
Cr	2060	2750	2900	2700	4110	4190	4430	6450
Mn	2020	5070	3540	2550	1928	1825	5200	1977
Co	145.7	150.3	170.1	160.4	127.0	129.8	147.6	151.1
Ni	454	683	700	667	363	398	623	760
Zn	213	128.9	149.5	150.4	144.2	134.6	97.6	235
Ga	16.93	12.62	13.07	12.47	17.01	18.02	16.42	15.15
Zr	457	227	232	225	672	683	474	462
Nb	1479	678	687	671	1896	1863	1652	1388
Hf	17.07	8.47	8.61	8.49	24.6	24.7	18.98	18.40
Ta	184.3	89.2	90.7	85.3	230	231	215	150.6
U	0.0407	bdl	bdl	bdl	bdl	0.0890	bdl	bdl
W	0.238	0.238	0.1830	bdl	0.300	0.261	bdl	0.269
Nb/Ta	8.02	7.60	7.57	7.87	8.23	8.05	7.69	9.22
Zr/Nb	0.309	0.335	0.337	0.336	0.354	0.367	0.287	0.333
Zr/Hf	26.8	26.8	26.9	26.5	27.3	27.6	25.0	25.1

A9.2. Trace element analyses of ilmenite (in ppm). NA stands for not analysed and bdl for analyses below detection limit

Sample	6A_a_033	6A_a_033	6A_d_053	6A_i_071	618-267a_c_144	618-267a_c_144	618-267a_c_149	618-267a_c_149
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
Compositional group	2	2	2	2	2	2	2	2
Texture	exsol	exsol	exsol	exsol	exsol	exsol	exsol	exsol
extra info								
Sc	39.2	34.9	63.2	31.0	87.7	58.5	112.4	82.4
V	2080	2080	3530	2680	934	3670	1250	2500
Cr	5390	5840	5570	9270	22700	27100	18800	24100
Mn	1402	1286	1858	1539	4280	62900	11710	2750
Co	119.1	124.0	171.2	163.6	123.8	104.1	123.8	101.2
Ni	220	236	196.0	353	726	699	819	761
Zn	156.8	141.1	206	164.0	309	3290	2420	bdl
Ga	21.5	19.10	30.4	27.8	0.00	35.0	60.8	11.70
Zr	2300	1900	3670	1630	678	2460	1080	1074
Nb	2910	2640	4510	2760	614	3650	1550	3250
Hf	80.8	77.1	163.0	83.5	25.0	86.0	38.1	40.3
Ta	301	305	684	479	129.7	457	244	457
U	bdl	bdl	bdl	bdl	bdl	0.279	bdl	bdl
W	bdl	0.528	bdl	bdl	bdl	0.221	bdl	bdl
Nb/Ta	9.67	8.66	6.59	5.76	4.73	7.99	6.35	7.11
Zr/Nb	0.790	0.720	0.814	0.591	1.104	0.673	0.697	0.330
Zr/Hf	28.5	24.6	22.5	19.52	27.1	28.6	28.3	26.7

Sample	22_b_068	22_c_070	22_d_072	22_d_074	22_e_077	26_i_030	50_1a_096	50_1c_100
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Tchiuzo	Tchiuzo
Compositional group	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info								
Sc	18.24	18.17	19.25	18.33	18.68	29.4	19.67	19.32
V	1181	1205	1206	1196	1253	1340	1168	1147
Cr	6030	6190	6320	6170	6430	8960	26400	27900
Mn	1954	2050	1979	1938	2090	2400	1881	1882
Co	145.7	155.0	149.4	148.0	165.6	128.7	145.7	142.9
Ni	742	765	762	730	780	661	1128	1144
Zn	232	235	226	230	250	172.0	193.1	211
Ga	14.68	14.67	15.24	14.29	15.81	18.88	14.53	14.56
Zr	461	450	473	470	451	826	491	485
Nb	1353	1359	1300	1314	1331	1588	1248	1279
Hf	18.50	17.60	20.0	19.48	18.30	30.5	18.92	17.66
Ta	161.0	163.0	154.9	157.3	165.0	179.6	156.1	156.9
U	bdl	bdl	bdl	bdl	bdl	0.0740	bdl	0.0355
W	0.329	0.341	0.314	0.321	0.325	0.401	0.312	0.335
Nb/Ta	8.40	8.34	8.39	8.35	8.07	8.84	7.99	8.15
Zr/Nb	0.341	0.331	0.364	0.358	0.339	0.520	0.393	0.379
Zr/Hf	24.9	25.6	23.6	24.1	24.6	27.1	26.0	27.5

A9.2. Trace element analyses of ilmenite (in ppm). NA stands for not analysed and bdl for analyses below detection limit

Sample	32A_b_074	32A_g_087	6A_d_055	6A_h_067	42_h_169	44_a_121	44_b_125	44_b_125
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Compositional group	2	2	2	2	2	3	3	3
Texture	exsol	exsol*	exsol*	exsol*	exsol*	met. 2	met. 2	met. 2
extra info								
Sc	22.9	30.0	27.1	25.8	25.1	20.3	18.41	18.64
V	2070	1936	1995	2220	2130	1240	1251	1242
Cr	11050	16900	4380	11400	8670	1966	1859	1819
Mn	1225	1399	962	1351	1415	3100	2030	2030
Co	107.9	102.1	114.5	148.9	120.4	147.6	147.4	148.1
Ni	259	261	163.1	398	325	378	369	354
Zn	130.0	144.0	109.3	147.8	133.0	234	268	254
Ga	20.2	13.40	21.3	24.6	22.6	16.27	15.01	14.65
Zr	1322	1371	1523	1426	1250	538	518	509
Nb	2480	2490	2240	2410	2310	1294	1292	1243
Hf	44.7	45.3	75.5	76.5	bdl	19.44	17.60	19.20
Ta	250	281	353	355	bdl	150.1	144.2	157.5
U	bdl	0.1200	bdl	bdl	bdl	bdl	bdl	bdl
W	bdl	0.301	bdl	bdl	bdl	0.477	bdl	0.321
Nb/Ta	9.92	8.86	6.35	6.79	-	8.62	8.96	7.89
Zr/Nb	0.533	0.551	0.680	0.592	0.541	0.416	0.401	0.409
Zr/Hf	29.6	30.3	20.2	18.64	-	27.7	29.4	26.5

Sample	50_1c_100	50_1d_104	59-A2_a_053	59-A2_a_053	59-A2_c_057	59-A2_c_057	59-A2_c_057	59-A2_c_059
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
Compositional group	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info								
Sc	18.81	17.40	17.84	17.36	15.05	14.94	14.99	18.66
V	1135	1153	1302	1336	1108	1121	1146	1297
Cr	26600	22500	1175	1251	2720	2690	2750	2530
Mn	1917	1847	2090	2160	2000	1972	2030	2110
Co	149.0	139.4	149.5	159.1	152.9	151.1	160.1	155.2
Ni	1153	1091	375	397	621	624	651	533
Zn	211	122.6	211	209	185.3	181.7	189.3	208
Ga	14.85	16.76	13.93	14.77	12.05	12.05	12.61	15.25
Zr	507	308	348	342	238	231	230	366
Nb	1252	761	1149	1194	859	866	857	1251
Hf	18.73	12.90	12.55	12.66	8.94	8.90	8.65	13.72
Ta	156.4	122.3	138.3	142.1	122.8	120.4	116.5	165.2
U	0.0312	0.0305	bdl	bdl	bdl	bdl	bdl	bdl
W	0.303	0.1290	0.234	0.251	0.1690	0.1700	0.1710	0.242
Nb/Ta	8.01	6.22	8.31	8.40	7.00	7.19	7.36	7.57
Zr/Nb	0.405	0.405	0.303	0.286	0.277	0.267	0.268	0.292
Zr/Hf	27.1	23.9	27.7	27.0	26.6	26.0	26.6	26.6

A9.2. Trace element analyses of ilmenite (in ppm). NA stands for not analysed and bdl for analyses below detection limit

Sample	44_d_132	44_g_141	44_g_141	44_g_141	35_i_060	35_i_061	35_i_062	26_i_029
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Compositional group	3	3	3	3	3	3	3	3
Texture	met. 2	met. 2	met. 2	met. 2	nodule	nodule	nodule	nodule
extra info					Mg-ilm rim	Mg-ilm rim	Mg-ilm rim	Mg-ilm rim
Sc	19.10	18.87	19.05	20.1	49.1	25.3	52.0	31.4
V	1257	1230	1223	1225	1510	1363	1173	1351
Cr	1752	1838	1817	1797	5510	4930	5770	9820
Mn	2650	2030	1993	1933	3140	1838	3540	2430
Co	196.0	146.3	142.6	144.4	138.1	139.1	126.5	131.8
Ni	373	364	350	354	879	597	776	637
Zn	291	246	248	224	139.0	202	142.0	202
Ga	14.40	15.10	14.85	15.90	16.30	19.40	10.10	14.83
Zr	539	557	523	551	776	831	504	724
Nb	1240	1360	1244	1267	1400	1620	877	1508
Hf	19.60	18.50	18.70	18.40	34.9	31.9	23.2	28.0
Ta	149.0	148.0	149.0	146.0	224	193.0	172.0	171.0
U	bdl	bdl	bdl	bdl	bdl	bdl	bdl	0.0637
W	bdl	0.263	0.298	0.247	bdl	0.323	bdl	0.390
Nb/Ta	8.32	9.19	8.35	8.68	6.25	8.39	5.10	8.82
Zr/Nb	0.435	0.410	0.420	0.435	0.554	0.513	0.575	0.480
Zr/Hf	27.5	30.1	28.0	29.9	22.2	26.1	21.7	25.9

Sample	59-A2_c_059	59-A3_a_060	59-A3_a_060	59-A3_a_060	59-A3_a_060	59-A4_a_063	59-A4_a_063	59-A4_a_066
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
Compositional group	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info								
Sc	18.52	15.94	16.09	16.18	15.68	16.88	17.60	17.55
V	1258	1168	1194	1155	1215	1226	1163	1144
Cr	2420	2360	2380	2340	2450	2630	2500	2460
Mn	2060	1995	1965	1937	2040	2200	2140	2090
Co	148.5	152.2	153.3	150.5	160.3	167.7	160.6	155.9
Ni	509	564	557	547	580	683	668	661
Zn	199.2	197.8	192.6	189.7	197.2	183.7	173.9	169.5
Ga	14.18	12.54	12.84	12.48	13.64	12.40	12.10	12.00
Zr	356	280	284	281	279	282	296	292
Nb	1221	913	932	913	922	955	968	960
Hf	13.54	10.61	11.00	11.16	10.81	10.24	10.98	10.91
Ta	164.7	120.2	126.6	124.9	120.8	129.6	137.2	135.2
U	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
W	0.251	0.1840	0.1920	0.1910	0.1890	0.1800	0.1650	0.1850
Nb/Ta	7.41	7.60	7.36	7.31	7.63	7.37	7.06	7.10
Zr/Nb	0.292	0.307	0.305	0.308	0.302	0.295	0.305	0.304
Zr/Hf	26.3	26.4	25.8	25.2	25.8	27.5	26.9	26.7

A9.2. Trace element analyses of ilmenite (in ppm). NA stands for not analysed and bdl for analyses below detection limit

Sample	26_j_032	26_j_033	26_j_033	12_a_007	12_a_008	12_c_020	12_d_022	12_d_022
Kimberlite	Cat 115	Cat 115	Cat 115	Lucapa	Lucapa	Lucapa	Lucapa	Lucapa
Compositional group	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info	Mg-ilm rim	Mg-ilm rim	Mg-ilm rim					
Sc	30.2	35.6	93.5	19.47	19.31	27.6	23.9	bdl
V	1629	1459	847	966	978	887	1074	1054
Cr	8340	8520	10280	15190	14590	11220	17190	13190
Mn	2810	3140	13000	2280	2490	5840	2060	16100
Co	115.6	110.6	131.6	178.4	190.5	235	152.2	148.0
Ni	785	783	788	1032	1130	1430	894	723
Zn	136.1	141.4	420	161.7	167.3	289	151.4	238
Ga	23.0	17.70	12.24	9.95	10.34	16.80	10.44	10.80
Zr	735	616	761	240	244	372	333	368
Nb	1930	1576	1544	467	430	1137	311	590
Hf	32.2	27.2	29.5	8.54	8.78	14.27	13.14	15.20
Ta	217	186.3	208	71.7	66.1	196.2	55.7	103.9
U	0.0844	0.0614	0.691	bdl	bdl	bdl	0.1350	bdl
W	0.273	0.225	0.594	0.0595	0.0861	0.203	bdl	bdl
Nb/Ta	8.91	8.46	7.42	6.51	6.51	5.80	5.58	5.68
Zr/Nb	0.381	0.391	0.493	0.514	0.568	0.327	1.070	0.624
Zr/Hf	22.8	22.6	25.8	28.1	27.8	26.1	25.3	24.2

Sample	59-A4_a_066	60A_1a_032	60A_1b_036	60A_2a_038	60A_3a_042	60A_4a_048	60A_5a_055	60A_6a_064
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
Compositional group	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info								
Sc	17.50	20.1	20.1	25.5	19.39	15.20	15.67	16.91
V	1149	1394	1363	1767	1455	1282	1314	1373
Cr	2450	3170	2730	6220	1521	2300	2380	1637
Mn	2110	2220	2160	2050	2250	2140	2120	2180
Co	153.1	151.0	149.0	131.0	152.7	166.5	162.9	167.7
Ni	657	507	506	360	350	589	580	472
Zn	167.3	238	232	215	234	239	232	251
Ga	11.97	16.80	17.20	18.60	17.31	14.44	14.38	15.65
Zr	289	455	458	763	440	245	265	305
Nb	957	1510	1420	2150	1321	804	896	988
Hf	10.63	16.30	17.50	28.0	16.14	9.79	11.10	11.39
Ta	138.0	181.0	184.0	246	161.0	103.0	130.4	124.7
U	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
W	0.1810	0.248	0.281	0.346	0.311	0.212	0.259	0.278
Nb/Ta	6.93	8.34	7.72	8.74	8.20	7.81	6.87	7.92
Zr/Nb	0.302	0.301	0.323	0.355	0.333	0.305	0.296	0.309
Zr/Hf	27.2	27.9	26.2	27.3	27.3	25.0	23.9	26.8

A9.2. Trace element analyses of ilmenite (in ppm). NA stands for not analysed and bdl for analyses below detection limit

Sample	12_d_024	2_c_044	2_c_045	2_d_049	2_e_054	26_c_007	26_c_008	31_c_081
Kimberlite	Lucapa	Lucapa	Lucapa	Lucapa	Lucapa	Cat 115	Cat 115	Cat 115
Compositional group	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info								
Sc	34.3	25.2	27.4	20.1	26.7	20.9	20.8	18.30
V	778	1093	1035	906	898	1564	1607	1336
Cr	11870	7560	12400	14540	16620	8980	9450	5510
Mn	15220	3760	4440	2410	4370	1792	1797	2040
Co	128.6	149.1	132.0	171.5	141.3	137.5	134.3	158.0
Ni	427	665	469	978	600	459	469	736
Zn	131.4	125.0	88.0	150.7	136.5	216	212	188.0
Ga	8.97	6.39	4.23	9.05	8.48	17.11	17.84	14.00
Zr	441	608	516	304	366	790	819	467
Nb	409	557	558	543	374	2140	2160	1511
Hf	15.63	25.3	24.6	15.29	12.94	34.4	35.5	18.70
Ta	62.3	92.9	84.3	90.0	55.7	224	231	161.0
U	bdl	0.209	bdl	bdl	bdl	bdl	0.0850	bdl
W	bdl	0.0920	bdl	0.0495	0.0653	bdl	1.100	bdl
Nb/Ta	6.57	6.00	6.62	6.03	6.71	9.58	9.35	9.39
Zr/Nb	1.078	1.092	0.925	0.560	0.979	0.369	0.379	0.309
Zr/Hf	28.2	24.1	21.0	19.90	28.3	23.0	23.1	25.0

Sample	65_1b_005	65_1c_010	65_2b_017	65_2c_021	65_2c_021	65_3a_023	65_3a_025	65_4a_028
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo
Compositional group	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info								
Sc	19.48	19.60	19.91	19.84	20.8	19.66	19.48	20.0
V	1408	1353	1336	1325	1391	1360	1396	1429
Cr	3300	3570	3590	3070	2870	2010	2140	2060
Mn	2040	2090	2130	2080	4080	1950	2210	2180
Co	149.9	143.5	145.8	143.0	146.0	148.0	155.1	155.0
Ni	466	457	445	438	456	452	469	469
Zn	232	227	218	209	195.6	218	220	222
Ga	17.69	17.19	16.81	16.71	17.20	17.52	17.28	17.34
Zr	469	484	485	480	473	488	475	482
Nb	1533	1635	1599	1601	1592	1517	1570	1585
Hf	16.58	17.28	17.49	17.32	17.65	17.70	17.31	17.65
Ta	182.1	210	209	205	206	191.3	199.3	192.9
U	0.0441	0.0367	0.0433	bdl	bdl	0.0397	0.0392	0.0341
W	0.291	0.276	0.261	0.255	0.330	0.237	0.247	0.245
Nb/Ta	8.42	7.79	7.67	7.82	7.71	7.93	7.88	8.22
Zr/Nb	0.306	0.296	0.303	0.300	0.297	0.322	0.303	0.304
Zr/Hf	28.3	28.0	27.7	27.7	26.8	27.6	27.4	27.3

A9.2. Trace element analyses of ilmenite (in ppm). NA stands for not analysed and bdl for analyses below detection limit

Sample	32A_l_098	34_b_011	34_d_017	34_d_017	34_f_021	6A(2)_z5_118	6A_j_076	618-267a_b_137
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Tchiuzo
Compositional group	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info								
Sc	18.20	20.3	19.59	18.80	21.0	21.9	19.30	19.54
V	1328	1651	1289	1277	1757	1719	1469	1385
Cr	5860	6610	6130	6550	6510	5740	7730	3390
Mn	1815	1891	2080	2140	1836	1999	1389	1940
Co	135.5	138.0	148.7	157.7	141.0	171.8	128.4	125.6
Ni	539	467	732	770	408	617	438	406
Zn	177.0	233	207	209	232	224	128.0	150.0
Ga	16.24	18.59	15.46	16.56	19.80	20.9	15.70	14.22
Zr	608	690	459	482	774	766	767	473
Nb	1700	1900	1122	1230	2000	2060	1590	1680
Hf	25.9	26.4	16.94	17.02	29.1	38.0	39.0	16.70
Ta	199.0	214	127.8	137.6	221	254	222	195.0
U	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
W	bdl	0.434	0.251	0.239	0.368	0.494	bdl	0.228
Nb/Ta	8.54	8.88	8.78	8.94	9.06	8.13	7.16	8.62
Zr/Nb	0.358	0.363	0.409	0.392	0.387	0.371	0.482	0.282
Zr/Hf	23.5	26.1	27.1	28.3	26.6	20.2	19.67	28.3

Sample	65_4a_030	618-267a_d_152	618-47_a_076	32A_i_094	32A_i_094	32A_i_094	32A_l_099	34_b_013
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115
Compositional group	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	sympl	sympl	sympl	sympl	sympl
extra info				Mg-rich	Mg-rich	Mg-rich	Mg-rich	Mg-rich
Sc	20.1	24.4	14.60	82.4	73.3	57.3	17.14	bdl
V	1412	1276	1382	1450	3560	2030	1280	1719
Cr	2070	4040	3130	15600	15270	11400	5270	6950
Mn	2090	1499	2100	?	2330	2720	2000	2050
Co	149.5	115.2	176.0	?	110.9	102.1	138.9	148.0
Ni	454	236	666	?	637	384	604	609
Zn	220	200	212	?	bdl	99.2	164.0	333
Ga	17.10	13.85	12.43	?	44.9	15.40	16.70	24.5
Zr	482	998	234	1480	2430	1407	547	841
Nb	1568	1849	700	1240	3220	1958	1730	2150
Hf	17.58	29.7	10.82	61.7	80.5	59.7	22.0	34.6
Ta	198.2	186.2	104.5	238	364	326	207	271
U	0.0421	bdl	bdl	bdl	bdl	bdl	bdl	bdl
W	0.289	bdl	bdl	bdl	bdl	bdl	0.400	bdl
Nb/Ta	7.91	9.93	6.70	5.21	8.85	6.01	8.36	7.93
Zr/Nb	0.307	0.540	0.334	1.194	0.755	0.719	0.316	0.392
Zr/Hf	27.4	33.6	21.6	24.0	30.2	23.6	24.9	24.3

A9.2. Trace element analyses of ilmenite (in ppm). NA stands for not analysed and bdl for analyses below detection limit

Sample	618-267a_b_137	618-267a_b_139	618-267a_c_143	618-267a_d_152	618-47_a_075	618-47_b_086	618-47_c_091	22_a_066
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Tchiuzo	Cat 115
Compositional group	3	3	3	3	3	3	3	3
Texture	nodule	nodule	nodule	nodule	nodule	nodule	nodule	nodule
extra info								recryst.
Sc	19.81	19.80	18.90	20.0	14.53	bdl	20.6	16.40
V	1491	1374	1368	1371	1375	1820	1587	1146
Cr	3530	2300	2210	2320	3260	14900	3800	5670
Mn	2140	2030	1940	1988	1866	16900	2250	1968
Co	140.2	137.0	130.1	133.2	177.0	bdl	166.0	140.9
Ni	456	398	394	426	679	bdl	462	702
Zn	169.0	128.0	136.0	155.5	213	bdl	227	212
Ga	16.50	13.10	13.10	14.87	12.43	bdl	17.90	12.71
Zr	511	428	440	481	227	bdl	501	371
Nb	1747	1410	1460	1536	658	1080	1550	1085
Hf	18.30	16.30	16.60	17.38	12.60	bdl	30.2	13.43
Ta	210	172.0	183.0	198.0	110.9	bdl	278	129.8
U	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
W	0.236	bdl	bdl	0.260	bdl	bdl	bdl	bdl
Nb/Ta	8.32	8.20	7.98	7.76	5.93	-	5.58	8.36
Zr/Nb	0.293	0.304	0.301	0.313	0.345	0	0.323	0.342
Zr/Hf	27.9	26.3	26.5	27.7	18.02	-	16.59	27.6

Sample	34_b_013	42-f_005	42-f_008	6A(2)_z4_109	6A_a_034	6A_a_035	6A_a_035	618-47_g_112
Kimberlite	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Cat 115	Tchiuzo
Compositional group	3	3	3	3	3	3	3	4
Texture	sympl	sympl	sympl	sympl	sympl	sympl	sympl	nodule
extra info	Mg-rich	Mg-rich	Mg-rich	Mg-rich	Mg-rich	Mg-rich	Mg-rich	Mg- Mn-ilm rim
Sc	bdl	bdl	bdl	bdl	67.3	105.0	101.0	63.6
V	1870	2360	1340	-	1360	1175	872	722
Cr	6660	8700	11300	16100	8200	9280	12330	12800
Mn	2240	2200	3830	NA	7340	16480	17600	18000
Co	151.0	-	bdl	991	136.0	259	510	160.0
Ni	579	588	1010	bdl	626	576	492	682
Zn	277	-	bdl	bdl	bdl	304	529	103.0
Ga	22.4	-	bdl	bdl	bdl	bdl	bdl	bdl
Zr	885	1670	bdl	1930	1495	1680	999	bdl
Nb	1890	1980	1175	1680	1720	1473	1067	bdl
Hf	30.1	bdl	bdl	82.0	81.9	100.3	58.7	bdl
Ta	238	220	bdl	292	408	407	325	bdl
U	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
W	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Nb/Ta	7.94	9.00	-	5.75	4.22	3.62	3.28	-
Zr/Nb	0.468	0.843	0	1.149	0.869	1.141	0.936	
Zr/Hf	29.4	-	-	23.5	18.25	16.75	17.02	-

A9.2. Trace element analyses of ilmenite (in ppm). NA stands for not analysed and bdl for analyses below detection limit

Sample	22_g_081	22_g_081	50_1d_104	59-A2_a_053
Kimberlite	Cat 115	Cat 115	Tchiuzo	Tchiuzo
Compositional group	3	3	3	3
Texture	nodule	nodule	nodule	nodule
extra info	recryst.	recryst.	recryst.	recryst.
Sc	22.6	20.9	19.35	17.89
V	1362	1327	1137	1312
Cr	6890	6870	29300	1170
Mn	2160	1762	1812	2130
Co	150.0	155.5	143.4	153.4
Ni	1046	789	1104	389
Zn	150.8	201	214	207
Ga	23.3	16.93	14.38	14.16
Zr	456	559	488	346
Nb	1314	1437	1256	1113
Hf	17.70	23.0	18.22	12.27
Ta	158.0	171.0	151.7	136.0
U	bdl	bdl	0.0316	0.0285
W	0.213	0.331	0.341	0.204
Nb/Ta	8.32	8.40	8.28	8.18
Zr/Nb	0.347	0.389	0.389	0.310
Zr/Hf	25.8	24.3	26.8	28.2

Sample	618-47_g_112	618-47_g_112	618-47_g_115
Kimberlite	Tchiuzo	Tchiuzo	Tchiuzo
Compositional group	4	4	4
Texture	nodule	nodule	Tabular
extra info	Mg- Mn-ilm rim	Mg- Mn-ilm rim	Mn-rich
Sc	49.4	59.4	130.0
V	1035	1021	2610
Cr	8980	9290	840
Mn	11150	21600	248000
Co	151.6	156.0	140.0
Ni	554	529	52.0
Zn	90.1	89.7	112.0
Ga	9.32	9.80	<mdl
Zr	853	864	8.40
Nb	1151	1106	470
Hf	bdl	35.7	0.0600
Ta	bdl	254	87.0
U	bdl	bdl	3.65
W	bdl	bdl	4.10
Nb/Ta	-	4.35	5.40
Zr/Nb	0.741	0.781	0.01787
Zr/Hf	-	24.2	140.0