1.8. Objectius de la tesi

Els tensioactius agrupen a una gran diversitat de productes d'ús comú i es troben presents en moltes activitats productives i de serveis, així com en l'àrea del consum domèstic o personal. El seu control, tant a nivell de formulacions industrials o en el medi ambient, requereix de metodologies que aportin simplicitat, rapidesa i seguretat en el procés analític i, alhora, que estiguin basades en la utilització de dispositius preparats mitjançant processos de fabricació estàndards que incideixen en el seu abaratiment.

En l'actualitat, tot i el gran nombre de tècniques clàssiques i instrumentals disponibles en aquest camp, algunes d'aquestes presenten dificultats derivades del seu caràcter manual i subjectiu, de la utilització de reactius problemàtics o, finalment, de la possible disponibilitat d'equips comercials. Darrerament, però, i paral·lelament al desenvolupament d'aquesta Tesi, cal destacar la introducció de nous elèctrodes comercials, integrats en sistemes valoradors, que faciliten la tasca analítica pròpia de les àrees de control de qualitat industrial.

Davant d'aquests reptes, el present treball va estar plantejat amb un objectiu global que pretén el disseny, la construcció i l'avaluació de nous sensors potenciomètrics selectius a anions tensioactius per tal de fer possible, en una segona etapa, el desenvolupament d'aplicacions analítiques per a aquestes espècies d'una forma avantatjosa.

El propi desplegament del treball experimental ha anat fixant altres objectius més particulars que, finalment, s'han anat concretant en les publicacions que s'adjunten en aquesta Memòria. En concret, en podríem destacar els següents:

a) Obtenir, amb un grau de qualitat acceptable, diferents parells iònics formats per l'associació entre un anió i un catió tensioactius, per tal d'estudiar la seva idoneïtat com a elements electroactius en membranes líquides de portador mòbil, integrables en matrius polimèriques diverses.

b) Construir i avaluar diversos elèctrodes selectius a anions tensioactius, de configuració convencional *all-solid-state* i membrana de PVC, aplicats sobre resines conductores d'epoxi-grafit, de forma que aquests dispositius reuneixin, com a principals característiques, una adequada selectivitat, una bona fiabilitat en la resposta, un baix cost unitari i facilitat en la preparació, amb la possibilitat d'adopció de diverses configuracions.

c) Seleccionar les millors membranes d'acord al seu comportament químic i dinàmic al llarg del període d'avaluació, per tal d'optimitzar, finalment, la formulació que permeti amb més garanties la seva utilització en posteriors aplicacions analítiques.

d) Validar el possible ús dels elèctrodes preparats en valoracions potenciomètriques d'anions tensioactius, en productes industrials i domèstics, d'acord als resultats que es puguin obtenir amb un mètode analític de referència.

e) Construir i avaluar sensors potenciomètrics de configuració tubular a tensioactius aniònics, integrables en sistemes d'anàlisi de flux continu, incorporant una selecció de les membranes anteriorment estudiades amb metodologia convencional.

f) Desenvolupar sistemes FIA per a la monitorització de sistemes reals que continguin anions tensioactius, explorant les possibilitats que ofereix el control automàtic del procés analític a partir de la multidetecció i adquisició de dades amb un microprocessador.

g) Preparar transistors d'efecte de camp selectius a anions tensioactius (ISFETs), a partir del revestiment de les membranes optimitzades en una etapa anterior. Estudiar, posteriorment, la seva resposta al llarg del temps de vida d'aquests dispositius, contrastant les possibles diferències que poden presentar respecte dels elèctrodes selectius de configuració convencional estudiats anteriorment.

h) Desenvolupar aplicacions per als ISFETs de membrana de PVC, aprofitant les facilitats potencials que presenten en la seva resposta en l'anàlisi per valoració potenciomètrica de mostres tensioactives.

i) Preparar i avaluar membranes selectives a tensioactius aniònics, alternatives a les clàssiques de matriu de PVC, reformulant els components de forma que resultin compatibles amb la utilització de polímers fotocurables de poliuretà acrilat, obrint així la possibilitat d'automatitzar completament el procés d'obtenció de noves membranes sensores.

j) Seleccionar i optimitzar, amb criteris objectivables, les membranes fotocurables preparades per tal de proposar diverses formulacions en relació a l'aplicació analítica posterior.

k) Preparar dispositius ISFET amb membranes fotocurables optimitzades, definint les etapes de preparació necessàries que permetin la seva obtenció en processos automàtics.

l) A partir dels ISFETs preparats, monitoritzar processos de tractament de contaminants tensioactius a partir de metodologies potenciomètriques adequades.

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