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Use of β -cyclodextrin as enhancer of ascorbic acid rejection in permselective films for amperometric biosensor applications

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ABSTRACT:

Interference rejection in amperometric biosensors can be more effective introducing some modifiers during electro-deposition of permselective film. Addition of β -cyclodextrin (β CD), a cyclic oligosaccharide composed of seven glucose units, to the *ortho*-phenyldiamine (*o*PD) monomer were already demonstrated to provide an enhancement in ascorbic acid (AA) rejection. Here we evaluated the improvement in permselectivity of poly-eugenol and poly-magnolol films electro-polymerized in presence of different amounts of β CD or eugenol- β CD inclusion complex for amperometric biosensor application. Starting from Pt-Ir wire as transducer several microsensors were covered with polymeric films doped with β CD-based modifiers through constant potential amperometry. Characterization of modified polymers was achieved by scanning electron microscopy and permselectivity analysis. Poly-magnolol film in combination with β CD showed a worsening in permselectivity compared to poly-magnolol alone. In contrast, the introduction of β CD-based modifier enhanced the interference rejection toward the archetypal interferent AA, while slightly affecting permeability toward H_2O_2 compared to the poly-eugenol without modifier. The AA rejection seems to be influenced by the availability of β CD cavity as well as film performance due to concentration of β CD-Eugenol inclusion complex. A poly-eugenol film co-polymerized with 2 mM β CD-eugenol inclusion complex showed a permselectivity equal to poly-

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