NICKEL TETRAAMINOPHTHALOCYANINE BASED FILMS FOR THE ELECTROCATALYTIC ACTIVATION OF DOPAMINE

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A novel electrode material was obtained by two consecutive procedures: (i) the electropolymerization of NiTAPc in DMF via the electro-oxidative N-N coupling of the amino groups, to achieve a film denoted poly-NiTAPc, followed by (ii) the electrochemical transformation of the poly-NiTAPc film in alkaline aqueous solution to form the interconnected O-Ni-O oxo bridges. The obtained film is then denoted poly-NiTAPc(OH). For the first time the electropolymerized poly-NiTAPc coating shows a clear electrocatalytic activity towards DA redox process, either as prepared or upon its electrochemical transformation in alkaline solution. Furthermore it clearly appears that poly-NiTAPc(OH) film exhibits a much larger electrocatalytic behaviour than the as-prepared poly-NiTAPc coating. This shows unambiguously the beneficial effect of the changes in the staking structure of the nickel phthalocyanine complexes upon the electrochemical treatment of the film in alkaline solution. It should emphasized here that the increase in the oxido-reduction currents related to DA on both films has not to be associated with any changes in the geometrical electrode area. This novel kind of material could present some interesting potentialities for a highly sensitive detection of others neurotransmitters [1].

Keywords : Electrocatalysis; Modified electrodes; Nickel phtalocyanine; Dopamine.

[1] Electrodeposition of Nickel phtalocyanines macrocyclic complex-based films: design, characterization and electrocatalytic detection of dopamine, A. Goux, F. Bedioui, Luc Robbiola and M. Pontié, Electroanalysis (2002) (in press).