Direct electrooxidation of 3-methyl-4-nitrophenol (MNP) at carbon fiber microelectrode (CFME)

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The direct electro-oxidation of 3-methyl-4-nitrophenol (MNP), main by-product of the insecticide fenitrothion (FT), both endocrine disruptors, leads to carbon electrode passivation due to electrodeposition of polyphenol on electrode surface. To overcome this problem usual electrochemical cleanings, help the users to treat the electrode surface. Due to the little diameter of the carbon fiber, this solution is unusable for a carbon fiber microelectrode (CFME). We proposed presently, for the first time on a CFME, an original anti-passivating strategy based on the optimization of the initial oxidation potential (-1.2 V vs 0 V/ Ag/AgCl) with or without a CFME modification by a film of nickel tetrasulfonated phthalocyanine (p-NiTSPc) electrodeposited in alkaline solution. This original strategy was studied in the light of electrode sensitivity dedicated to MNP analysis.

Keywords: CFME; MNP; Electrochemical cleaning, anti-passivation, initial potential; p-NiTSPc film

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