

Electrochemical reduction of nitrite at poly-[Ru(5-NO₂-phen) 2Cl] tetrapyrrolylporphyrin glassy carbon modified electrode

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This work describes the preparation of modified electrodes with Poly-tetraruthenated porphyrin. Also, a detailed Raman and electrochemical characterization of these surfaces is shown. Glassy carbon electrodes were modified with Ni (II), Zn (II) and metal free polymeric film of tetrapyrrolylporphyrin coordinated to four [Ru(5-NO₂-phen) 2Cl]⁺ moieties. These modified electrodes are very stable in aqueous solutions, and were evaluated for the electrochemical reduction of nitrite ion at pH = 5.9 in 0.1 M NaClO₄. When the solution contains 0.01 M nitrite, linear sweep voltammetry results, show an enhancement in the current from -0,3 V with the conducting polymers, compared to the bare electrode behavior. Analyses after controlled potential electrolysis experiments verify the production of hydrazine, hydroxylamine and ammonia. Hydroxylamine was the product of higher production among the three studied catalysts. The behavior of the modified electrodes allows predicting that the reduction proce