

## **Electrocatalytic oxidation of hydrogen peroxide by poly(Ni<sup>II</sup>-teta) complex modified electrodes**

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Electrochemical methods based on the direct reduction or oxidation of substrate molecules at bare electrodes are often not suitable for analytical applications because the electrode reactions are subjected to large over-voltage. Modifying the surface of an electrode with a redox mediator is a well-established strategy for achieving wider applicability of electroanalytical methodology. In the past few years, there has been an increasing interest in the study of electrocatalytic properties of tetra-azamacrocyclic metal complexes of cobalt and nickel. Ni(II) and Co(III) with tetra-azamacrocyclic ligands have been reported as exceptionally efficient and selective electro- and photocatalysts for the reduction of CO<sub>2</sub>, nitrate, nitrite and O<sub>2</sub>. The determination of H<sub>2</sub>O<sub>2</sub> and organic peroxides is rapidly gaining practical importance in clinical industries and environmental fields. Conventional methods for the determination of peroxides such as spectrophotometry, colorimetry and chemiluminescence involve complicated methods and suffer from various interferences. The need for simple, sensitive and rapid detection schemes for monitoring peroxides has promoted much of the research in the development of sensors for these applications. In this paper, we report the electrocatalytic behaviour of Ni<sup>II</sup>-teta (teta = *C-meso*-(5,5,7,12,12,14-hexamethyl-1,4,8,11-tetra-azacyclotetradecane)), polymerized on an electrode surface, towards the oxidation of hydrogen peroxide. To prepare poly(Ni<sup>II</sup>-teta) incorporated Nafion modified electrode, Nafion coated glassy carbon electrode was used. These poly(Ni<sup>II</sup>-teta) modified electrodes electrocatalysed the oxidation of hydrogen peroxide. The mechanism of the hydrogen peroxide oxidation at the modified electrodes and the influence of Nafion film are discussed.