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Title: ELECTROCHEMICAL OXIDATION OF IODIDE AT A GLASSY CARBON ELECTRODE IN METHYLENE CHLORIDE AT VARIOUS TEMPERATURES

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Abstract:

Anodic electrooxidation of iodide in 0.1 mol L^{-1} TBAP/ CH_2Cl_2 was studied electrochemically via cyclic voltammetry, convolution transforms voltammetry, chronoamperometry and chronopotentiometry techniques at a glassy carbon electrode (GCE) at various temperature ranging from -20°C to 21°C . It was found that at less positive potential triiodide (I_3^-) is formed followed by a moderate fast chemical process, while at more positive potential, the triiodide is oxidized to iodine (I_2) followed by another chemical process, i.e EC_1EC_2 scheme. The effect of lowering the temperature on the heterogeneous electron transfer rate constant and the diffusion coefficient was discussed. The relevant chemical and electrochemical parameters of the electrode reaction were determined. The accurate test of the parameters evaluated experimentally was verified by comparing the experimental voltammograms with the simulated one.

Keywords: Convolution transforms voltammetry, electrochemical parameters, digital simulation, chronoamperometry, chronopotentiometry

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Title: Electrochemical and SEM properties of Co^{2+} ion in hexagonal mesophase of pluronic lyotropic liquid crystal template

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Abstract:

The electrochemical and SEM properties of Co ion in hexagonal mesophase of the pluronic lyotropic liquid crystal template are reported. The cyclic voltammetric studies evidenced the occurrence of two slow electron transfer reduction processes. Such a reaction presumably related to the reduction of Co^{2+} ion to Co metal. The hexagonal (H_1) lyotropic liquid crystalline phases of P_{84} surfactant have been used to template the electrochemical deposition of nanostructured cobalt films as well as its uses as background electrolyte. Electrochemical studies show that these films have very high surface areas, which reveals that the deposited film exhibits promising properties. The electrode parameters of Co(II) ion in hexagonal meso phase of the lyotropic liquid crystal ternary system (pluronic P_{84} /cobalt/p-xylene) is determined using cyclic voltammetry, deduced convolutive voltammetry and chronoamperometry techniques. The morphology of nanostructured deposited films of Co^{2+} ion in pluronic lyotropic liquid crystal template was investigated via scanning electron microscopy (SEM) technique.

Keywords: Electrochemical properties; hexagonal mesophase; liquid crystal; deduced convolutive voltammetry; chronoamperometry.