

The Electrochemical Atomic Layer Deposition of Pt and Pd Nanoparticles on Ni Foam for the Electro Oxidation of Alcohols

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Abstract

Electrodeposition of Pt and Pd metal by surface limited redox replacement reactions was performed using the electrochemical atomic layer deposition. Carbon paper and Ni foam were used as substrates for metal deposition. Supported Pt and Pd electrodes were characterised using electrochemical methods and scanning electron microscopy (SEM). Cyclic voltammograms of the electrodeposited Pt and Pd on substrates showed features characteristic of polycrystalline Pt and Pd electrodes respectively. Ethanol oxidation in alkaline media was highly favoured on Pd/Ni foam than on Carbon paper while methanol oxidation was favoured more on Carbon paper than on Ni foam. Carbon paper and Ni foam produced good quality deposits and the EDX confirmed the presence of Pt and Pd particles.