

Behaviour of Bimetallic Pt–Pd Carbon-Supported Catalysts in Methanol Electrooxidation

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Carbon powder supported bimetallic 8w%Pt+8w%Pd/C, 8w%Pt+6w%Pd/C, 8w%Pt+4w%Pd/C, 8w%Pt+2w%Pd/C, 8w%Pt/C and 8w%Pd/C samples were prepared, characterised and tested for the electrooxidation of methanol. The particle sizes were found to depend greatly on the composition and the metal content. With pure palladium and samples rich in palladium, the diameter of the bimetallic particles was around 150 nm, but with pure Pt and samples poor in Pd it was much smaller, below 5 nm. The electrocatalytic activity of these catalysts was determined by cyclic voltammetry and polarization curves. Compounds with 33 and 43 at%Pd were the most active catalysts for the methanol oxidation reaction. A good correlation was obtained between electrochemistry and *in situ* infrared reflectance spectroscopy results.

Key words: Carbon Supported Platinum-Palladium Catalysts, Methanol Electrooxidation, *in-situ* Infrared Reflectance Spectroscopy, SNIFTIRS and SPAIRS