Short Communication

Effect of the Electrodeposition Potential of Platinum on the Catalytic Activity of a Pt/GC Catalyst Toward Formic Acid Electro–Oxidation

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The electrocatalytic activity of platinum (Pt)–modified glassy carbon (GC) (referred as Pt/GC) electrodes toward the formic acid electro–oxidation (FAO) was investigated. The Pt deposition on the GC substrate was carried out by a potentiostatic technique at different potentials (from 0.2 V to –0.2 V vs. Hg/Hg₂Cl₂/KCl (sat.) reference electrode) and the corresponding influence on the catalytic activity toward FAO was monitored. The electrocatalytic inspection revealed a potential role for the Pt deposition potential in boosting the catalytic efficiency of the catalyst toward FAO and further in mitigating the CO poisoning that eventually deactivate the catalyst. Interestingly, the highest activity toward FAO was obtained at the Pt/GC electrode for which Pt was electrodeposited at 0.05 V. This was reflected from its high I_p^d/I_p^{ind} (20) and I_p^d/I_b (0.83) ratios that were employed to assess the electrocatalytic performance of the catalyst.

Keywords: Formic acid electro–oxidation; Pt nanoparticles; Electrodeposition potential; Fuel cells.

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