

Graphene-supported Pt-Pd Nanostructures with Enhanced Catalytic Activities for Methanol Electrooxidation in Alkaline Medium

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In this work, the Pt-Pd nanostructures supported on reduced graphene oxide (RGO) were successfully synthesized by surfactant-free wet-chemical approach. The physicochemical characterization of the prepared catalysts was verified using X-ray diffraction (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM), high-resolution TEM (HRTEM), energy-dispersive X-ray (EDX) spectroscopy, Raman spectroscopy and X-ray photoelectron spectroscopy (XPS). It was found that Pt-Pd nanocrystals with unique structure and high dispersion were successfully grown onto the surface of RGO. Methanol electrooxidation on Pt-Pd/RGO catalysts was investigated by voltammetry and chronoamperometry in alkaline medium. The RGO-supported Pt-Pd catalyst (Pt-Pd/RGO) demonstrates significantly high performance compared to Pt/C for the methanol electrooxidation.

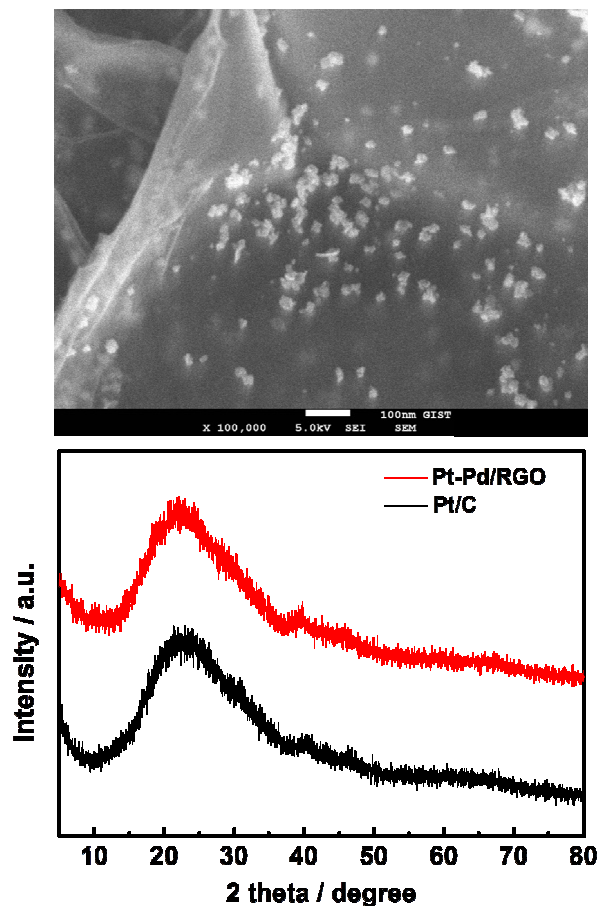


Figure 1. Typical SEM images of the Pt-Pd/RGO and the XRD patterns of Pt-Pd/RGO and Pt/C catalysts.

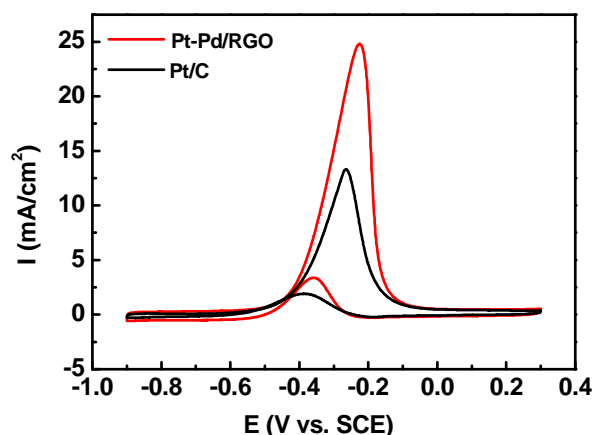


Figure 2. Cyclic voltammograms of the Pt-Pd/RGO and Pt/C catalysts recorded in 0.5M NaOH + 0.5M CH₃OH (scan rate 50mV s⁻¹).

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