

## عنوان مقاله:

One-step synthesis of Pd<sub>3</sub>Co alloy nanoparticles deposited on reduced graphene oxide as an electro-catalyst for the oxygen reduction reaction in passive direct methanol fuel cells

## محل انتشار:

فصلنامه هیدروژن و پیل سوختی ایران، دوره 2، شماره 1 (سال: 1394)

تعداد صفحات اصل مقاله: 8

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## خلاصه مقاله:

We reported on a Pd-Co (3:1)/graphene oxide (Pd<sub>3</sub>Co /GO) catalyst through a onestep strategy. GO is synthesized from graphite electrodes using ionic liquid-assisted electrochemical exfoliation. Controllable GO-supported Pd<sub>3</sub>Co electrocatalyst is then reduced by ethylene glycol as a stabilizing agent to prepare highly dispersed PdCo nanoparticles on carbon graphene oxide to be used in an oxygen reduction reaction in passive direct methanol fuel cell (DMFC) catalysts. The performance of these electrodes in the ORR was measured with cyclic voltammetry (CV), linear sweep voltammetry (LSV), electrochemical impedance spectroscopy (EIS), chronoamperometry (CA), inductive coupled plasma (ICP), X-ray diffraction (XRD) and scanning electron microscopy coupled to energy dispersive X-ray (SEM- EDX). Since the Pd<sub>3</sub>Co/GO alloy electrocatalysts are inactive for the adsorption and oxidation of methanol, it can act as a methanol-tolerant ORR catalyst in a direct methanol fuel cell (DMFC). A membrane-electrode assembly (MEA) has been prepared by employing of the Pd<sub>3</sub>Co/GO as a cathode for a passive direct methanol fuel cell and characterized by polarization curves and impedance diagrams. A better performance was obtained for the cell using Pd<sub>3</sub>Co/RGO (3.56 mW cm<sup>-2</sup>) compared to Pd/RGO (1.75 mW cm<sup>-2</sup>) and Pt/C-Electrochem (1.9 mW cm<sup>-2</sup>) as a cathode in the DMFC.

## کلمات کلیدی:

,One-step synthesis, Reduced graphene oxide, Pd-Co nanoparticles, ORR, Passive DMFC

## لینک ثابت مقاله در پایگاه سیویلیکا:

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