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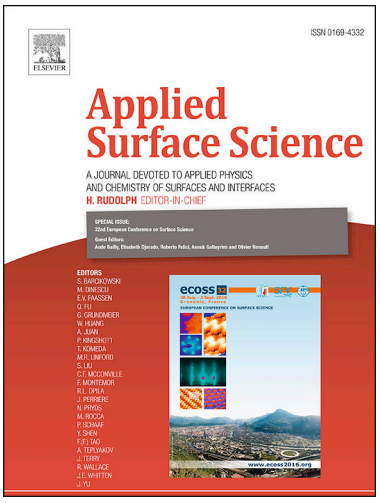

Full Length Article

Pd nanonetwork decorated on the rGO as a high-performance electrocatalyst for ethanol oxidation

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ACCEPTED MANUSCRIPT

Pd nanonetwork decorated on the rGO as a high-performance electrocatalyst for ethanol oxidation

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Abstract

A three-dimensional palladium nanonetwork decorated on the reduced graphene oxide (rGO) is synthesized by simple and rapid method. In this method, graphene oxide (GO) is reduced on a glassy carbon electrode by Zn/HCl system. After reduction of GO to rGO, three dimensional Pd nanonetwork is fabricated on rGO by reduction of deposited $PdCl_2$ using Zn/HCl system. The morphology and chemical composition of as-prepared 3-D Pd/rGO catalyst is characterized by scanning electron microscopy and energy dispersive spectroscopy, respectively. We revealed that the as-synthesized 3-D Pd nanonetwork shows excellent electrocatalytic activity and durability toward ethanol oxidation due to the formation of the 3-D nanonetwork and porous structure. The specific activity of 3-D Pd/rGO toward ethanol oxidation is 12.3 times higher than commercial Pd/C. Durability and tolerance to carbonaceous intermediates accumulation of the as prepared catalyst are also greatly improved.

Keywords: Palladium nanonetwork, Reduced graphene oxide, Ethanol oxidation

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