Synthesis of Au-modified Reduced Graphene Oxide Supported Pd-Ni nanocomposites and electrocatalytic activity for propane-1,3-diol oxidation

Xudong Huang¹, Tianci Niu², Yujie Shi³, Yan Jiang^{*}

Jiangsu Key Laboratory of Advanced Catalytic Materials and Technology, Changzhou University, Jiangsu 213164, People's Republic of China

*E-mail: jy@cczu.edu.cn

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A Reduced Graphene Oxide-Supported Pd-Ni nanocomposite (Pd₁Ni₄/RGO) was prepared by simultaneous chemical reduction, on the surface of which a small amount of Au nanoparticles were subsequently deposited via potentiostatic deposition to obtain an Au-deposited Pd₁Ni₄/RGO (denoted as Au_(x)-Pd₁Ni₄/RGO, x = 1, 2, and 5 s, representing the deposition time of Au). As a representative, the surface structure of the Au_(1s)-Pd₁Ni₄/RGO electrode was characterized and analyzed by scanning electron microscopy (SEM), transmission electron microscopy (TEM), energy dispersive X-ray spectrum (EDX) and X-ray diffraction (XRD), respectively. The modification approach described here is simple, effective and versatile, which can be further used to modify other metal substrates with an additional metal. Moreover, the Au deposition induces a positive effect on the electro-catalytic activity for propane-1,3-diol oxidation in alkaline media in comparison to the Pd₁Ni₄/RGO.

Keywords: nanocomposite; electrocatalytic activity; electrode; catalyses.

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