Short Communication

Fabrication of Ultrafine Amorphous Pd-Ni-P Nanoparticles Supported on Carbon Nanotubes as an Effective Catalyst for Electro-oxidation of Methanol

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We presented the fabrication of ultrafine amorphous Pd-Ni-P nanoparticles with a mean size of 3 nm. During the reduction, the use of borane *tert*-butylamine complex was crucial for the small particle formation. Notably, the addition of strong reducing reagent does not lead to the formation of crystallized Pd or Ni-P phases at all. The amorphous Pd-Ni-P composite was proved to be the most efficient catalyst in comparison with Pd, Pd-Ni, and even its crystalline counterpart for the electrochemical oxidation of methanol in alkaline medium. Moreover, compared with Vulcan XC-72, carbon nanotubes was found to be a more effective support with which 1.8 times high specific activity was achieved.

Keywords: palladium; amorphous materials; nanoparticles; carbon nanotube; electro-oxidation

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