

One-pot synthesis PdAu bimetallic composite nanoparticles and their catalytic activities for hydrogen peroxide generation

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In this article, we report a one-pot aqueous-phase synthesis of PdAu bimetallic nanoparticles with different Pd/Au ratio. The synthesis was conducted by co-reduction of Pd and Au precursor using ascorbic acid as a reducing agent and in the presence of polyallylamine hydrochloride (PAH). By high-angle annular dark field scanning transmission electron microscopy (HAADF-STEM) and energy-dispersive X-ray spectrometry (EDS) analyses, we found that the synthesized nanoparticles had an onion like core/shell/shell/shell structure with a Au-rich core, a Pd-rich shell, a Au-rich shell, and Pd shell, respectively. In addition, we also investigated catalytic performance of the synthesized PdAu nanoparticles toward the hydrogen peroxide generation reaction.

Keywords: PdAu nanoparticles, core/shell, bimetallic, one-pot synthesis, hydrogen peroxide generation