

Synthesis RhAg bimetallic composite nanoparticles for improved catalysts on direct synthesis of hydrogen peroxide generation

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This study reports on the aqueous-phase synthesis of rhodium-silver (RhAg) bimetallic composite nanoparticles with a controllable Rh/Ag ratio. Due to the high cost of Rh compared with Ag, the RhAg nanoparticles were synthesized in two steps: the synthesis of Ag nanoparticles and the formation of a Rh-rich RhAg area on the surface of the Ag nanoparticles. Transmission electron microscopy and corresponding elemental mapping analyses exhibited that the synthesized 20 nm-sized quasi-spherical RhAg nanoparticles were composed of Ag-rich and Rh-rich area, respectively. Considering the amount of Rh used and productivity, the RhAg nanoparticles with a Rh content of 0.8% exhibited the best catalytic performance for the direct H<sub>2</sub>O<sub>2</sub> generation reaction.