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Bimetallic nanoparticles by solvothermal synthesis

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Bimetallic nanoparticles have recently attracted much attention, because of their unique catalytic, electronic, optical, magnetic and other novel dual (depending on metals) properties and wide range of possible applications. The bimetallic nanoparticles can be generally divided into two types in the structure: The alloyed and the core/shell structure bimetallic nanoparticles. In this study, we present Au-Fe/Au-Fe3O4 nanoparticles prepared by solvothermal method. The solvothermal process involves the use of a solvent under moderate to high pressure (up to 20 MPa) and temperature (up to 300 °C) that facilitates the interaction of precursors during synthesis. Fe nanoparticles with size range of 5-10 nm were synthesized using pulsed plasma in liquid (PPL) method. The Fe nanoparticles along with $HAuCl_4$ (1.0 mM concentrated solvent) and Trisodium Citrate Didydrate (TCD: $C_6H_5Na_3O_7*2H_2O$) were mixed and the solution was heated up to 150 °C for 2 hours to prepare Au-Fe bimetallic nanoparticles. Fe nanoparticles by PPL were served as the core and $HAuCl_4$ as Au source-shell, respectively. The TCD served as reducing agent for Au nanoparticles. Finally, obtained Au-Fe nanoparticles by solvothermal synthesis were characterized via XRD, TEM, EDS, UV-Vis Spectroscopy and Vibrating Sample Magnetometer Analysis.

Biography

Kelgenbaeva Zhazgul has studied her Bachelor's (BS) in Arabayev Kyrgyz State University (Bishkek, Kyrgyzstan) and Post-graduation in National Academy of Sciences of the Kyrgyz Republic. She completed her PhD from the Department of New Frontier Sciences, Kumamoto University, in 2015 (Japan). She is a Skills Assistant in Institute of Pulsed Power Sciences of Kumamoto University since April 2015 and a Post-doctoral Researcher in Department of New Frontier Sciences since March 2016. She has published more than 5 papers in reputed journals in two languages: English and Russian (Newsletter of National Academy of Sciences of the KR).

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