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Highly selective oxidation of benzyl alcohol to benzaldehyde catalyzed by Zn-Fe_2O_4@ZnO core-shell nanostructures

Rahmatollah Rahimi, Mahdi Heidari-Golafzani and **MahboubehRabbani**
Iran University of Science and Technology, Iran

In this study, ZnO nanoparticles have been immobilized on the surface of Zn-Fe_2O_4 nanohallow spheres by sol-gel method and the core-shell structure of Zn-Fe_2O_4@ZnOnanohallow spheres were characterization by scanning electron microscopy (SEM), transmission electron microscopy (TEM) and vibration sample magnetometery (VSM). The SEM images reveal formation of sphere structure. The TEM micrographs confirm that the size of catalyst is about 150 nm and the thickness of ZnO shell is smaller than 30 nm. Results of VSM illustrate that Zn-Fe_2O_4@ZnOparticles are superparamagnetic.The catalytic activity ofZn-Fe_2O_4@ZnOnanohallow spheres was investigated for oxidation ofbenzylic alcohols using H_2O_2 as an oxidant.The resultant Zn-Fe_2O_4@ZnOnanohallow spheres were highly selective for oxidation of benzyl alcohols to corresponding benzaldehydes. It was found that the as–prepared catalyst display the excellent performance, whereby, 100% selectivity ofbenzaldehydewas achieved at close to 92% conversion.

Biography

Rahmatollah Rahimi has completed his PhD at Howard University (USA). He has been now serving as a full Professor in the Department of Chemistry, Iran University of Science and Technology. He has published about 90 papers in reputed journals.

Rahimi_rah@iust.ac.ir

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