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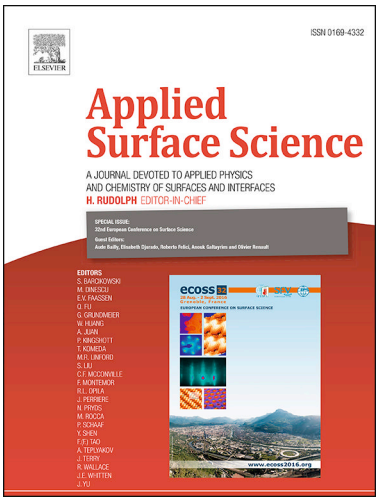

Full Length Article

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Mesoporous Cu_2O-CeO_2 Composite Nanospheres with Enhanced Catalytic Activity for 4-Nitrophenol Reduction

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Abstract

In this paper, mesoporous Cu_2O-CeO_2 nanospheres were fabricated via a facile, low-temperature solution route in the presence of poly(2-vinylpyridine)-*b*-poly(ethylene Oxide) (P2VP-*b*-PEO) block copolymers. The prepared mesoporous Cu_2O-CeO_2 nanospheres were characterized systematically by scanning electron microscopy (SEM), X-ray diffraction (XRD), transmission electron microscopy (TEM), thermogravimetric analysis (TGA), X-ray photoelectron spectroscopy (XPS) and nitrogen adsorption/desorption. The formation mechanism of mesoporous Cu_2O-CeO_2 nanospheres was discussed. The results show that the molar ratios of Ce^{3+}/Cu^{2+} and the reaction time have an important influence on the nanostructure of Cu_2O-CeO_2 composite spheres. The resultant Cu_2O-CeO_2 nanospheres exhibit superior catalytic activities in the reduction of 4-nitrophenol to 4-aminophenol by $NaBH_4$. The activity factor ($K = k/m$) for the Cu_2O-CeO_2