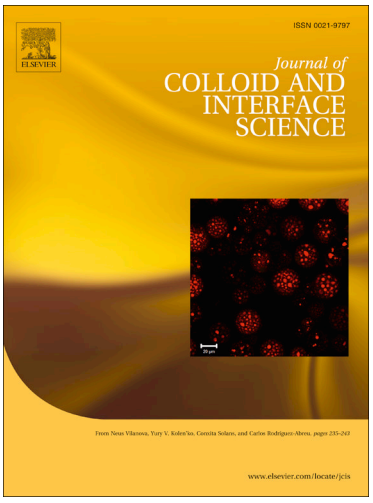

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Abstract

In this work, AuPd@Pd core-shell nanocrystals (AuPd@Pd NCs) were fabricated by a one-pot co-reduction approach, where theophylline-7-acetic acid (TAA) acted as a new structure-directing agent. The crystal structure and composition were mainly characterized by scanning electron microscopy (SEM), transmission electron microscopy (TEM), high-angle annular dark-field scanning transmission electron microscopy (HAADF-STEM), X-ray diffraction (XRD), together with X-ray photoelectron spectroscopy (XPS). The growth mechanism of AuPd@Pd NCs was investigated in detail. The obtained AuPd@Pd NCs exhibited superior catalytic characters for formic acid oxidation reaction (FAOR) and glycerol oxidation reaction (GOR) in contrast with commercial Pd black in alkaline media.

Keywords: Core-shell nanocrystals; Theophylline-7-acetic acid; Formic acid oxidation; Glycerol oxidation