Design and Synthesis of Silica Supported Nanoporous Gold-Palladium Bimetallic Catalyst for Alkyl Benzene Oxidation

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Abstract

Gold palladium (Au-Pd) bimetallic catalysts are very promising for various reactions including oxidative catalysis. Mesoporous silica supported Au-Pd catalysts have large surface area, controlled hydrophobic and fill-sites and are thus highly efficient for the oxidation of alkyl benzene to selective products. Alkyl Benzene oxidation is important for the productions of drugs, perfumes, polymers, insecticides and pesticides. Unfortunately, the efficient oxidation of alkyl benzene has been remaining a challenging task due to lack of suitable catalysts. Functionalized mesoporous silica with ordered surface and uniform porosity is an exciting template for the synthesis of supported catalysts. Metal precursors could be co-impregnated on the highly ordered surface of amine functionalized silica. This method facilitates great dispersion of the Au-Pd with tiny and controlled particle size. Here, we described a two-step adsorption-reduction method along with various ratios of metal loadings for the synthesis of silica supported nanoporous Au-Pd catalyst for alkyl benzene oxidation.

Keywords: Alkyl benzene, mesoporous silica, gold-palladium.