Fe2O3-SnO2 Nanocomposite for Photocatalytic Oxidation of Nitric Oxide

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Abstract

A novel visible-light-activated Fe2O3-SnO2 nanocomposite photocatalyst was prepared by co-precipitation method and characterized by X-ray diffraction, transmission electron microscopy, N-2 adsorption-desorption measurement and UV-visible diffuse reflectance spectroscopy. The results showed that a Fe2O3 and SnO2 were present in the composites. The characterization results found that the phase composition, crystallite size, BET surface area and optical absorption of the samples varied significantly with the molar ratio of Sn to Fe. The Fe2O3-SnO2 photocatalyst (the molar ratio of Fe to Sn is 2: 1) calcined at 550 degrees C for 5 h exhibited maximum photocatalytic activity because it has a smaller band gap and a higher surface area of 120 m(2) g(-1). Under visible-light irradiation, the degradation efficiency of nitric oxide reached 95.0 %, which is ca. 1.72 times higher than that of the nanoparticles SnO2 (Aldrich).

Keywords

Author Keywords: Fe2O3-SnO2 composites; Co-precipitation synthesis; Photocatalytic activity; Nitric oxide; Photocatalytic oxidation efficiency

KeyWords Plus: SELECTIVE CATALYTIC-REDUCTION; VISIBLE-LIGHT; WASTE-WATER; TIO2; DEGRADATION; NOX; ABSORPTION; MECHANISM; REMOVAL; AMMONIA

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