

REACTION KINETICS, CATALYSIS

载体二氧化钛的晶型对对硝基苯酚加氢催化剂Ni/TiO₂的影响

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摘要 The catalytic hydrogenation of p-nitrophenol to p-aminophenol was investigated over Ni/TiO₂ catalysts prepared by a liquid-phase chemical reduction method. The catalysts were characterized by inductively coupled plasma (ICP), X-ray powder diffraction (XRD), transmission electron microscopy (TEM), X-ray photoelectron spectra (XPS) and temperature-programmed reduction (TPR). Results show that the titania structure has favorable influence on physio-chemical and catalytic properties of Ni/TiO₂ catalysts. Compared to commercial Raney nickel, the catalytic activity of Ni/TiO₂ catalyst is much superior, irrespective of the titania structure. The catalytic activity of anatase titania supported nickel catalyst Ni/TiO₂(A) is higher than that of rutile titania supported nickel catalyst Ni/TiO₂(R), possibly because the reduction of nickel oxide to metallic nickel for Ni/TiO₂(A) is easier than that for Ni/TiO₂(R) at similar reaction conditions.

关键词 [p-nitrophenol](#) [catalytic hydrogenation](#) [p-aminophenol](#) [Ni/TiO₂ catalyst](#)

分类号

The Effect of Titania Structure on Ni/TiO₂ Catalysts for p-Nitrophenol Hydrogenation

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Abstract

The catalytic hydrogenation of p-nitrophenol to p-aminophenol was investigated over Ni/TiO₂ catalysts prepared by a liquid-phase chemical reduction method. The catalysts were characterized by inductively coupled plasma (ICP), X-ray powder diffraction (XRD), transmission electron microscopy (TEM), X-ray photoelectron spectra (XPS) and temperature-programmed reduction (TPR). Results show that the titania structure has favorable influence on physio-chemical and catalytic properties of Ni/TiO₂ catalysts. Compared to commercial Raney nickel, the catalytic activity of Ni/TiO₂ catalyst is much superior, irrespective of the titania structure. The catalytic activity of anatase titania supported nickel catalyst Ni/TiO₂(A) is higher than that of rutile titania supported nickel catalyst Ni/TiO₂(R), possibly because the reduction of nickel oxide to metallic nickel for Ni/TiO₂(A) is easier than that for Ni/TiO₂(R) at similar reaction conditions.

Key words [p-nitrophenol](#) [catalytic hydrogenation](#) [p-aminophenol](#) [Ni/TiO₂ catalyst](#)

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