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The use of nano supported nickel catalyst in reduction of p-nitrophenol using hydrazine as hydrogen donor

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Abstract

p-Aminophenol was prepared by hydrogenation of p-nitro phenol over nano-sized nickel catalysts supported on two different supports, SiO2 and Al2O3. Hydrazine hydrate was used as hydrogen source in this reaction. Several loadings of nano-sized Ni were used, thus 20, 5, and 2.5 wt% were prepared. X-ray diffraction (XRD) and electron spin resonance (ESR) were employed to investigate the prepared catalysts. The Ni/Al2O3 was found to be more effective and give high durability. The catalytic activity of the reaction was found to be influenced by both the crystallinity of the nickel and the strain among nano-sized nickel particles. The prepared catalysts showed higher catalytic activity, especially at lower loading. During the reaction, a detectable change of the color was observed from yellow to green and finally to colorless, which enable us to suppose a mechanism of this reaction. © 2010 Taylor & Francis.

Author Keywords

Catalytic activity; ESR; Hydrogenation; Nano nickel; p-aminophenol; p-nitrophenol; XRD

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