Synthesis and characterization of ruthenium@silica nanocatalyst for the reduction of 4-nitropehnol to 4-aminohenol

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A nanocatalyst of ruthenium-silica nanoparticles (Ru@SNP) has been synthesized by using a simple impregnation method. SNP were synthesized by the W/O emulsion method which make the whole process environmentally acceptable. As synthesized SNP and Ru@SNP was characterized with SEM, TEM and XPS technique. TEM image showed that Ru is dispersed evenly over SNPs thereby providing large surface area without aggregation. The catalytic activity of Ru@SNP was probed for the reduction 4-nitrophenol to 4-aminophenol in the excess of sodium borohydride. Ru@SNP showed an enhanced catalytic activity as compared to the ruthenium-silica(Bulk) catalyst prepared through similar method. The adsorption of 4-nitrophenolate on SNPs kept for a long time showed that reaction was totally take place due to Ru which acts as active site for Ru@SNP.