Rhodium Nanoparticle Catalysts Stabilized with Modified Polyvinylpyrrolidones

Significance: Rhodium nanoparticle catalysts coated with a modified polyvinylpyrrolidone (PVP) were developed. The Rh nanoparticles (NPs) coated with 1 (1-Rh) exhibited thermal and catalytic stability compared to Rh NPs coated with PVP (PVP-Rh). Hydrogenation of aromatic substrates was performed with 1-Rh, or 2-Rh to give the corresponding cyclohexanes.

Comment: Rh NPs were characterized by X-ray photoelectron spectrometry (XPS), transmission electron microscopy (TEM), and high-resolution transmission electron microscopy (HRTEM). Catalyst 1-Rh was reused without loss of catalytic activity in the hydrogenation of phenol (14 times) and toluene (8 times) while PVP-Rh showed significant loss of catalytic activity.