Enhancement of Hydrogen Storage in Palladium Nanoparticles

사미울라, 남기석*, 황상운, 렌주자차리아
전북대학교
(nahmks@chonbuk.ac.kr*)

Much attention has been focused on the palladium-hydrogen system in ultrafine structured Pd, because Pd has a great affinity for hydrogen. The synthesis of stable nanometer-size palladium particles by condensed phase reduction and their characterization are described and their hydrogen absorption properties were investigated. The particle size of the palladium nanoparticles was controlled by varying the concentration of stabilizing agent. The palladium nanoparticles were characterized by X-ray powder diffraction (XRD), scanning electron microscopy (SEM), energy dispersive-ray spectroscopy and transmission electron microscopy (TEM). The average diameter of the particles was estimated to be 7.7± 0.5 and 13.0 ± 0.6 nm from the transmission electron microscopy (TEM) observations. The electron diffraction pattern exhibited four diffused rings, which could be assigned to (111), (200), (220), and (311) reflection of face centered cubic Pd. Crystalline palladium nanoparticles were observed by the X-ray powder diffraction pattern. The hydrogen storage capacity of palladium nanoparticles was observed around 0.92 % under an equilibrium hydrogen pressure of 1.67 MPa at 298 K.