Pd(OH)$_2$-PdCO$_3$ AMORPHOUS POWDER GROWN BY CHEMICAL BATH AND ITS TRANSFORMATION INTO PD NANOCRYSTALS AFTER THERMAL ANNEALING TREATMENT

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In this report, the growth of Pd(OH)$_2$-PdCO$_3$ amorphous powders by using the green chemical bath at ~80ºC temperature was carried out, and then further submitted to thermal annealing treatment (TAT) at ~1000ºC in an air atmosphere. Scanning Electron Microscopy (SEM), X-ray diffraction (XRD), Fourier Transform Infrared (FTIR), optical absorption (OA) and Photoluminescence (PL), examined the transformation of such powders into Palladium nanoparticles. The FTIR displayed absorption bands in the ?400-3600 cm$^{-1}$ region, which can be attributed to the vibrations of anions and bands located at ?708, ~578, ?1638 cm$^{-1}$, as well as at ~3013 cm$^{-1}$ which are typical of the OH$^-$ vibrations presented in the as-grown powders. These bands disappeared completely after TAT. XRD diffractograms of Pd presented five peaks (111), (200), (220), (311), (222). The band gap energy showed two transitions located at ~1.5eV and ~3.7 eV.

Keywords: Pd(OH)$_2$-PdCO$_3$, amorphous growth, chemical bath

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