

HYDROGEN ADSORPTION ON NANOPOROUS Pd-C FILMS

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In this work we present nanoporous material based on carbon and palladium. The material obtained in form of a thin film (thickness ~ 300nm) and consists of palladium nanograins embedded in carbon matrix. Because of Pd nanoparticles presence this film can be used as an active layer in hydrogen and hydrogen compounds sensor applications.

Our nanoporous palladium-carbonaceous materials are obtained in two steps method physical and chemical vapor deposition. Precursors of nanoporous films are palladium acetate and fullerene C₆₀. TEM, SEM and Raman spectroscopy methods are used to characterize the prepared thin films. Our studies showed that palladium nanograins have *fcc* type of crystal structure and their sizes are between 5nm and 100nm. The structure of carbonaceous matrix depends on the technological process parameters and could be changed from amorphous carbon through fullerenes grains to graphene plains.

Using the BET isotherm method (Fig. 1) we estimated that the real surface area of Pd-C films is 20 times bigger than the geometrical surface area thus films could be reflected in hydrogen adsorption process

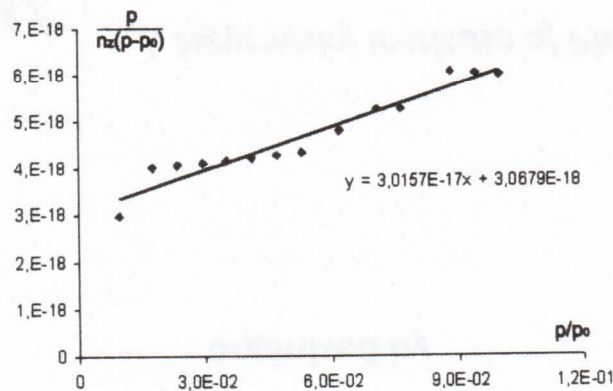


Fig. 1 The BET isotherm using Xe

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