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## **NANOSTRUCTURAL C-Pd FILMS FOR HYDROGEN SENSING – INTERACTION WITH HYDROGEN**

Nanostructural carbonaceous palladium films (C-Pd films) prepared by physical vapor deposition (PVD) method and annealed in argon atmosphere at the temperature of 500°C interact with hydrogen and change their resistance with changing hydrogen concentration. This behavior is connected to the adsorption and dissolution of hydrogen in palladium nanograins. In this presentation we show dynamical changes of C-Pd films structure due to hydrogen concentration changes.

The structure of prepared C-Pd films was studied by transmission electron microscopy (TEM) and X-ray diffraction (XRD) methods. TEM results show us the size and distribution of palladium nanograins within the film. XRD experiment was performed in a flow of hydrogen through especially designed experimental cell and it shows the changes in the film structure.

Resistance changes due to hydrogen concentration changes for C-Pd films were also measured. The results of these measurements are shown in Fig. 1. These results are consistent with XRD results and can be interpreted as an effect of formation of solid solution of hydrogen in palladium at lower H<sub>2</sub> concentration and creation of palladium hydride at higher H<sub>2</sub> concentration.

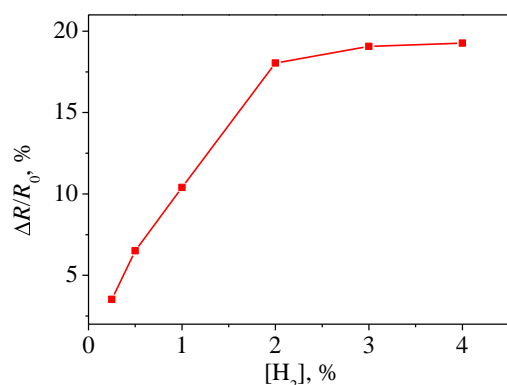


Fig. 1. Sensitivity of C-Pd film in the function of hydrogen concentration

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