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Optical Properties of Pd and PdO films exposed to hydrogen¹ JONATHAN AVILA, ALEJANDRO CABRERA, MARIO FAVRE, ULRICH VOLKMANN, P. Universidad Catolica, JORGE ESPINOSA, DAVID LEDERMAN, West Virginia University, DEPARTAMENTO DE FISICA, P. UNIVERSIDAD CATOLICA TEAM, PHYSICS DEPARTMENT, WEST VIRGINIA UNIVERSITY TEAM — Pd and PdO are of great interest in industry due to their chemical and electrical properties. For long time, Pd have been studied as a solid state storage medium of hydrogen, due to the huge absorption capacity of this gas. PdO could be used as a photocathode for the production of hydrogen in photoelectrolysis cells. In this work transmittance spectroscopy measurements in the optical/NIR range of thin films of Pd/quartz and PdO/quartz are shown. This property is monitored as a function of time upon hydrogenation. Semiconductive PdO films gradually reduce into metallic Pd when exposed to hydrogen, as confirmed by XRD, showing no appreciable shift of the bandgap during the process. The transmittance of Pd films increases by $\sim 30\%$ in this spectral range for pressures of ~ 40 torr of hydrogen, the increase peaking at about 730nm. The transmittance measurements seem to be a very simple and fast method for monitoring this kind of systems.

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