

Abstract Submitted
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Hydrogen Reduction at Room Temperature of Partially Oxidized Co Cluster Films Capped with Pd¹ A. L. CABRERA, J. I. AVILA, R. TRABOL, Pontificia Universidad Catolica de Chile, C. ROMERO, M.J. VAN BAEL, P. LIEVENS, Katholieke Universiteit Leuven — Co clusters with mean size of 1.8 nm were deposited on sapphire substrates at 25°C, 300°C and 500°C respectively. They were capped by a continuous 15 nm Pd film. Visible light transmission and reflection, in the range 400 to 900 nm, were measured when the samples were exposed to different hydrogen pressures up to 130 Torr. D.C. electrical resistance of the films was also measured as an independent property of the films to confirm hydrogen absorption by the samples. In all the samples the transmission and resistance of the films increased, reaching saturation at around 35-40 Torr hydrogen pressure. The relative change in the resistance of all Co cluster samples is smaller than the change in pure Pd films, indicating that hydrogen absorption is limited to the Pd capping layer only. We observed a significant decrease in the transmittance and the resistance during the first hydrogenation cycle of the sample prepared at 25°C suggesting that a reduction of the partially oxidized Co clusters occurred at room temperature.

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