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The absorption of hydrogen by Nb thin films capped with Pd studied by transmission of visible light[1] J. I. AVILA, A. L. CABRERA, Facultad de Fisica, Pontificia Universidad Catolica de Chile, G. B. CABRERA, DAVID LEDERMAN, Department of Physics, West Virginia University, Morgantown —
Samples of Nb films with thickness between 2.5 to 14 nm were deposited on glass and capped by a continuous 6 nm Pd film in a sputtering system. The light transmission and reflection, in the visible range (400 to 1000 nm), were measured when the sample was exposed to different hydrogen pressure up to 75 Torr. Experiment on continuous pure Pd film and Nb film for were done for comparison. The relative change in transmission for Nb at 74 Torr of hydrogen is about 5 percent but the saturation occurs after 2500 s. A sample of 14 nm Nb capped by Pd shows a 7 percent increased in transmission at the same pressure but the saturation time is reduced to 50 s, same as pure Pd. Change in the kinetics of hydrogen absorption by Nb capped with Pd indicates that the rate limiting step in the absorption process by pure Nb is located on the Nb surface.

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