

TRANSMISSION RESONANCE RESPONSE OF NI FILMS WITH ARRAYS OF SUBWAVELENGTH HOLES TO TiO₂ NANOCOATINGS

KENNETH R. RODRIGUEZ , HONG TIAN , JOSEPH M. HEER, AND JAMES V. COE, *Department of Chemistry, The Ohio State University, Columbus, OH 43210.*

Nanocoatings of TiO₂ (15-105 nm in thickness) were applied to one side of freestanding Ni films with microarrays of subwavelength holes exhibiting extraordinary transmission effects in the infrared. Shifts in the positions of the transmission resonances at perpendicular incidence have been characterized vs. coating thickness. Second order equations have been developed using analogies from the theory of angle-tuned attenuated total reflection experiments on metal coated prisms. These equations allow calculation of effective dielectric properties and TiO₂ film thickness from simple FTIR measurements