

Abstract Submitted
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Dielectric function of Ni-Pt alloys from 0.6 to 6.6 eV by spectroscopic ellipsometry L.S. ABDALLAH, S. ZOLLNER, NMSU, C. LAVOIE, A. OZCAN, IBM, M. RAYMOND, GLOBALFOUNDRIES — The complex dielectric function ε of metals is difficult to determine, because it depends on crystallinity, purity, native oxide, surface roughness, thickness, deposition method, etc. Nevertheless, a precise knowledge of ε is useful for process control in semiconductor manufacturing. In this work, we have determined ε of thin Ni-Pt alloy films (10% to 25% Pt, 10 nm thickness) from 0.6 to 6.6 eV using spectroscopic ellipsometry. The films were sputtered on thick SiO₂ layers to avoid reaction with the Si substrate. The ellipsometric angles (determined at three angles of incidence) were fitted using previously determined optical constants for Si and SiO₂. The optical constants for the metal were described with a Drude (free carrier) term, a pole due to lattice absorption (outside of our spectral range), and three weak interband transitions modeled with Lorentz oscillators. Variations with composition (from 10% to 25% Pt) and annealing at 500 ° C for 30s were insignificant.

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