

Abstract Submitted
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Composition Dependence of the Optical Conductivity of NiPt Alloys Determined by Spectroscopic Ellipsometry LINA ABDALLAH, TAREK TAWALBEH, IGOR VASILIEV, STEFAN ZOLLNER, New Mexico State University, CHRISTIAN LAVOIE, IBM Research Division, T.J. Watson Research Center, AHMET OZCAN, IBM Systems and Technology Group, MARK RAYMOND, GLOBALFOUNDRIES — The complex dielectric function of different Ni-Pt alloys (0% to 25% Pt concentration, 10nm thickness) was determined using spectroscopic ellipsometry over a broad photon energy range from 0.6 to 6.6eV. Data were fitted using basis spline functions as well as Drude-Lorentz oscillators to describe free carrier absorption and interband transitions. We found absorption peaks at 1.5 and 4.7 eV due to interband transitions. Results showed a broadening in the absorption peak of Nickel with increasing the Platinum concentration in the alloy. The experimental results were compared with ab initio density functional theory band structure calculations which showed that adding Platinum enhances the density of states of Nickel especially at low energies. Annealing the metals at 500° C for 30 s increases the optical conductivity.

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