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Infrared optical conductivity for $Ni_{1-x}Pt_x$ alloys and $Ni_{1-x}Pt_xSi$ monosilicides[1] LINA ABDALLAH, S. ZOLLNER, New Mexico State University, C. LAVOIE, A. OZCAN, IBM, M. RAYMOND, GLOBALFOUNDRIES — We used infrared spectroscopic ellipsometry to measure the optical constants of $Ni_{1-x}Pt_x$ alloys and $Ni_{1-x}Pt_xSi$ monosilicides in the infrared region (200-6000 wave numbers). Nickel platinum alloys (up to 30% Pt) were deposited on top of a thick layer of thermal oxide. Similar alloys were deposited on top of silicon and were annealed at 500 ° for 30 seconds to create monosilicides. The Pt composition dependence of the optical conductivity of the unreacted metal and monosilicide was investigated. We also studied the thickness dependence of Ni1-xPtx alloys. Four different fitting techniques were applied to our data using a point-by-point fit as well as an oscillator fit where we found a two carrier effect in the dielectric function of the unreacted metal. The data obtained from the IR region was combined with previous data in the visible spectrum to get more comprehensive optical constants for both unreacted metal and reacted silicide. Results indicate that optical conductivity is higher for thicker samples. Furthermore SiO_2 has a strong absorption peak at 1040 wave numbers caused by bond stretching vibration. This absorption peak appears in the ellipsometric data of the thinner films and is absent in thicker ones.

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