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Optical and magneto-optical properties of MnPt_3 films (abstract)

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Optical and magneto-optical properties of MnPt₃ films (abstract)

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Optically thick films of MnPt₃ were prepared by magnetron sputtering onto quartz substrates. Postdeposition annealing at 850 °C resulted in highly textured (111) films with the L1₂ (Cu₃Au) structure. MnPt₃ films are ferromagnetic with a Curie temperature of 380 °C, and they show large magneto-optical effects in the visible.^{1,2} These films also show a high degree of long-range order. The diagonal components of the dielectric tensor were determined using variable angle spectroscopic ellipsometry measurements over the spectral range 1.2–2.4 eV. Magneto-optic Kerr rotation and ellipticity measurements were made at near normal incidence over the spectral range 1.4–3.6 eV to determine the off-diagonal components of the MnPt₃ dielectric tensor. First-principles electronic structure calculations were carried out for the ordered MnPt₃ structure, and from these the components of the dielectric tensor were calculated. We find excellent agreement between the measured and calculated diagonal components, but only fair agreement for the off-diagonal components. © 1997 American Institute of Physics. [S0021-8979(97)87008-9]

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