

4-15-1997

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

Kurt W. Wierman

Seagate Corporation, Pittsburgh, PA

J. N. Hilfiker

University of Nebraska - Lincoln

Renat F. Sabiryanov

University of Nebraska - Omaha, rsabirianov@mail.unomaha.edu

Sitaram Jaswal

University of Nebraska, sjaswal1@unl.edu

Roger D. Kirby

University of Nebraska-Lincoln, rkirby1@unl.edu

See next page for additional authors

Follow this and additional works at: http://digitalcommons.unl.edu/physics_kirby



Part of the [Physics Commons](#)

Wierman, Kurt W.; Hilfiker, J. N.; Sabiryanov, Renat F.; Jaswal, Sitaram; Kirby, Roger D.; and Woollam, John A., "Optical and magneto-optical properties of MnPt₃ films (abstract)" (1997). *Roger Kirby Publications*. Paper 9.

http://digitalcommons.unl.edu/physics_kirby/9

This Article is brought to you for free and open access by the Research Papers in Physics and Astronomy at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Roger Kirby Publications by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Authors

Kurt W. Wierman, J. N. Hilfiker, Renat F. Sabiryanov, Sitaram Jaswal, Roger D. Kirby, and John A. Woollam

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

K. W. Wierman

Behlen Laboratory of Physics, University of Nebraska, Lincoln, Nebraska 68588

J. N. Hilfiker

Department of Electrical Engineering, University of Nebraska, Lincoln, Nebraska 68588

R. F. Sabiryanov, S. S. Jaswal, and R. D. Kirby^{a)}

Behlen Laboratory of Physics, University of Nebraska, Lincoln, Nebraska 68588

J. A. Woollam

Department of Electrical Engineering, University of Nebraska, Lincoln, Nebraska 68588

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]

Research sponsored by the NSF under Grant No. OSR-92355225 and by the Center for Materials Research and Analysis.

^{a)}Electronic mail: rdk@unlinfo.unl.edu

¹K. W. Wierman and R. D. Kirby, *J. Magn. Magn. Mater.* **154**, 12 (1996).

²T. Kato, p.H. Kikusawa, S. Iwata, S. Tsunashima, and S. Uchiyama, *J. Magn. Magn. Mater.* **140-141**, 713 (1995).