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

Segate Corporation, Pittsburgh, PA

J. N. Hilfiker
University of Nebraska-Lincoln

Renat F. Sabirianov
University of Nebraska at Omaha, rsabirianov@unomaha.edu

Sitaram S. Jaswal
University of Nebraska-Lincoln

Roger D. Kirby
University of Nebraska-Lincoln

See next page for additional authors

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Authors

Segate Corporation, Pittsburgh, PA; J. N. Hilfiker; Renat F. Sabirianov; Sitaram S. Jaswal; Roger D. Kirby; and John A. Woollam

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]

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

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