

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Magneto-optic Properties of $\text{Co}_{1+x}\text{Ge}_x\text{Fe}_{2-2x}\text{O}_4$ SEONG-JAE LEE, Center for Nondestructive Evaluation, Iowa State University, SANG-HOON SONG, Materials Science and Engineering, Iowa State University, DAVID JILES, Wolfson Centre for Magnetism, Cardiff University, IOWA STATE UNIVERSITY TEAM, CARDIFF UNIVERSITY TEAM — Recently, cobalt ferrite composites and their modifications based on chemical substitution have been actively investigated as part of the development of materials for highly sensitive non-contact stress and torque sensors. Research into the magneto-optic properties of cobalt ferrites and their modifications has also been undertaken because of their potential application to magneto-optic recording media. In the present study, the polar Kerr rotations for a series of Ge-substituted cobalt ferrite $\text{Co}_{1+x}\text{Ge}_x\text{Fe}_{2-2x}\text{O}_4$ samples have been investigated. The samples were prepared by standard powder ceramic techniques and the photon energy range of the magneto-optic polar Kerr spectra was measured between 1.5 and 3.0 eV with increments of 0.05 eV. Comparison the polar Kerr rotation spectra for $\text{Co}_{1+x}\text{Ge}_x\text{Fe}_{2-2x}\text{O}_4$ with those of recently reported $\text{CoFe}_{2-x}\text{Ga}_x\text{O}_4$ samples and the analyses of the origin of the peaks in the polar Kerr spectra and the observed shift of peak position resulting from Ge-substitution using the intervalence charge-transfer (IVCT) transition, in which an electron from a metallic cation is transferred to a neighboring cation through an optical excitation, will be presented.

Seong-Jae Lee
Center for Nondestructive Evaluation, Iowa State University

Date submitted: 03 Dec 2006

Electronic form version 1.4