

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Magnetism in Mo-doped Yttrium Iron Garnet S. KHANRA, Missouri State University, Y. KOLEKAR, University of Pune, M. LANGHOFF, P. KAHOL, K. GHOSH, Missouri State University — Yttrium iron garnet (YIG) is a synthetic garnet and ferrimagnetic, with chemical formula $Y_3Fe_5O_{12}$. In YIG, five iron (III) ions occupy two octahedral and three tetrahedral sites, with the yttrium (III) ions coordinated by eight oxygen ions in an irregular cube. The iron ions in the two coordination sites exhibit different spins, resulting in magnetic behavior. Bulk YIG has been synthesized systematically by solid state reaction method. The formation of pure YIG have been investigated through X-ray diffraction (XRD) beginning from weighing in molar proportions of Y_2O_3 and Fe_2O_3 , mixing and grinding, pre-sintering and final sintering at 1300 °C. XRD study shows that YIG exhibits cubic structure with lattice constant of about 12 Å. Magnetization with varying field and temperature has been measured using a SQUID magnetometer. Magnetic measurement of Mo YIG has shown that magnetic moment increase initially and then decreases with Mo doping. Detailed results will be discussed in this presentation. This work is supported by National Science Foundation (Award Number DMR-0907037).

Kartik Ghosh
Missouri State University

Date submitted: 19 Nov 2012

Electronic form version 1.4