

Abstract Submitted
for the OSF16 Meeting of
The American Physical Society

Effect of annealing temperature and environment on the structure and luminescence of CeYAG nanophosphors. SAHIL AGARWAL, Bowling Green State Univ — Yttrium Aluminum Garnet (YAG), $Y_3Al_5O_{12}$ is one of the most important optical materials with many applications such as scintillation, laser host materials, detectors and phosphors. Nano YAG could offer many advantages over bulk materials and large grain size phosphors. In this work Ce doped YAG (CeYAG) nanoparticles were synthesized using simple chemical methods and crystallized by annealing at various temperatures ranging from 600°C - 1500°C . Photo-luminescence was recorded showing the increase in luminescence intensity with the increased annealing temperature. XRD analysis reveals the distortion in lattice as the annealing temperature goes beyond 1200°C . Temperature induced photo-luminescence was studied for nanophosphor annealed at 1300°C and was compared with the CeYAG ceramic and single crystal. Trapping phenomena were studied in CeYAG nanophosphors and ceramics by thermally stimulated luminescence spectroscopy and a comparison was made between them and CeYAG single crystals. Measurements concluded that trapping is dominated by crystal defects in single crystals and by trapping sites at the grain boundaries in ceramics. CeYAG nanophosphors-on the other hand- are free of traps, which seems to be characteristic of their small grain structure.

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Date submitted: 12 Sep 2016

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