Abstract Submitted
for the OSS16 Meeting of
The American Physical Society

Improved synthesis of YAG nanophosphors for light emitting diodes DAVID WINARSKI, ANTHONY COLOSIMO, Bowling Green State University, AMIN KHAMECHI, Washington State University, FARIDA SELIM, Bowling Green State University — Ce-doped YAG (CeYAG) is an excellent phosphor for blue light emitting diodes (LED) with unique properties including strong absorption at the blue LED wavelength, broad-band yellow emission and high quantum efficiency. CeYAG phosphors synthesized by simple chemical methods would reduce cost and enhance performance. In this work, we synthesize YAG nanophosphors using the sol-gel method. It is obvious that the use of nano-phosphors instead of large grain-sized phosphors should reduce light scattering. YAG and CeYAG precursors were prepared using metal nitrates with various chemical agents and photo-irradiation and then converted to a gel and then solid by a series of heat treatments. Polymerization agents and photo-irradiation are investigated for their effects on YAG particle size and luminescence. The use of photo-irradiation led to the formation of a pure YAG phase at relatively low temperatures. In addition, photo-irradiation and polymerization agents slightly reduced particle size. X-ray induced luminescence spectroscopy was applied to examine the luminescence efficiency of CeYAG nanocrystals, revealing a strong luminescence at 525nm.

David Winarski
Bowling Green State University

Date submitted: 16 Mar 2016 Electronic form version 1.4