

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Synthesis and characterization of ZnO nanocrystals co-doped with Ce³⁺ and Tb³⁺ KELLY MCCUTCHEON, CHRISTIE LAROCHELLE, Franklin and Marshall College — Rare earth doped zinc oxide nanocrystals produce visible emissions under ultraviolet excitation. Using a sol-gel process, we synthesized a series of ZnO nanocrystals doped with Tb³⁺ and Ce³⁺ in silica glass, keeping the ZnO/SiO₂ ratio constant at 10/90 and doping with 1% rare earth by weight, with varying relative concentrations of Tb³⁺ and Ce³⁺. The nanocrystals were characterized using photoexcitation and emission spectroscopy, time-resolved photoluminescence, UV/VIS spectroscopy, and transmission electron microscopy. We determined that co-doping with cerium enhanced the visible terbium emissions to a point, with the most effective enhancement occurring at mid-range Ce³⁺ concentrations.

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Date submitted: 23 Nov 2010

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