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Characterization of Nanophosphors for Solid State Lighting Devices Grown by Microwave Plasma Assisted Deposition Process JEDIDIAH MCCOY, Morningside College, MAREK MERLAK, SARATH WITANACHCHI, University of South Florida — Increasingly, greenhouse farming and urban agriculture are being looked at as a more efficient and more cost effective way to grow produce. Currently the lights used in greenhouses rely on light sources that emit a broad spectrum of light. However, only light at wavelengths around 460 nm (blue) and 670 nm (red) are absorbed by most plants for photosynthesis. Solid state lighting devices can be engineered to produce light to match the needs of the plant while reducing the energy cost. An investigation into the photoluminescence properties of the nanophosphor La_2O_3 doped with Bi was done in an effort to produce a phosphor emitting in blue wavelengths. The La_2O_3:Bi coatings were grown using a microwave plasma growth process. Microwave power and chamber pressure were varied to find the optimum synthesis conditions. Power was varied from 100Watts to 900Watts and chamber pressure was varied from 30Torr to 60Torr. The process utilized O_2 and CO_2 plasma. The nanophosphors were investigated by X-ray diffraction, electron microscopy, and photoluminescent spectroscopy. Photoluminescence was shown to be higher from samples synthesized in a CO_2 plasma.

Jedidiah McCoy
Morningside College

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