

**Microstructure and Optical Properties of an
Oxynitride Ceramic Phosphor**

M. Raukas

M. Hannah, D. Johnston, J. Montaner, Z. Yu

OSRAM SYLVANIA Corporate Technology

71 Cherry Hill Dr, Beverly, MA

S. Tragl

OSRAM Corporate Technology

2 Mittelstetter Weg, Schwabmünchen, Germany

A.Rucki, V.Klüppel

Siemens Corporate Technology

Otto-Hahn-Ring 6, Munich, Germany

E. Jones, M. Wang, X. Zhou, S. Gradecak

Department of Materials Science

77 Massachusetts Ave, Cambridge, MA

Luminescent materials sintered into high relative density and homogeneous body have gained prominence over the past decade. The impetus for this can clearly be found in the development of LEDs. The advent of high brightness / small emitting area pump sources of various wavelengths have prompted the search for more efficient, highly engineered converters to be used in phosphor-converted LEDs (pc-LEDs).

We have investigated an oxynitride of alkaline earth [1], namely Eu-doped $\text{SrSi}_2\text{O}_2\text{N}_2$ in its powder and monolithic ceramic form to follow the development and understand the relationship between microstructure (porosity and grains as well as grain boundary material) and optical properties (transmission and luminescence profiles, quantum efficiency) by means of Scanning and Transmission Electron Microscopy (SEM, TEM) coupled with micro-cathodoluminescence ($\mu\text{-CL}$) and x-ray or electron diffraction. The importance of such understanding and also the chemical and phase purity of the ceramic material for its luminescence efficiency will be shown and discussed.

[1]. A.C.A. Delsing, H.T. Hintzen, Y.-Q. Li, WO/2004/030109, (2004).