

Nature of the Eu^{2+} emission in the UV LED phosphor $\text{Sr}_2\text{SiO}_4:\text{Eu}^{2+}$

H.A. Comanzo¹, A.A. Setlur¹, A.M. Srivastava¹, P. Schmidt², Bo Wen² and U. Happek²

¹GE Global Research

1 Research Circle

Niskayuna, NY 12309

²Department of Physics and Astronomy

University of Georgia

Athens, GA 30605

The optical properties of the yellow-red emitting UV LED phosphor (405 nm), $\text{Sr}_2\text{SiO}_4:\text{Eu}^{2+}$ has been investigated in the temperature range of 10 K- 300 K. Two different Eu^{2+} centers are observed in accordance with the crystal structure. From the low temperature excitation and emission spectrum, a Stokes shift of 4025 cm^{-1} for the Eu_B center is derived. At room temperature, the FWHM of the emission band is 3166 cm^{-1} . Experiments were conducted to determine if photoionization [1] was responsible for the observed Eu^{2+} luminescence in Sr_2SiO_4 . We find no evidence for photoionization for wavelengths greater than 350 nm (Eu_B). For shorter wavelengths we do find a signal in the Thermally Stimulated Luminescence Excitation Spectroscopy (TSLES) [2] that is indicative of photoionization.

1. P. Dorenbos, J. Phys. Cond. Matt. **15**, 2645 (2003).

2. J. Fleniken, J. Wang, J. Grimm, M. J. Weber and U. Happek, J. Lumin., 94-95 (2001) 465