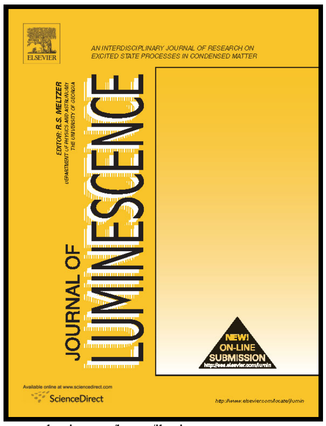

www.elsevier.com/locate/jlumin

White Light Emission and Color Tunability of Dysprosium doped Barium Silicate Glasses

Lokesh Mishra, Anchal Sharma, Amit K. Vishwakarma, Kaushal Jha, M. Jayasimhadri, B.V. Ratnam, Kiwan Jang, A.S. Rao, R.K. Sinha

PII: S0022-2313(15)00496-2
DOI: http://dx.doi.org/10.1016/j.jlumin.2015.08.063
Reference: LUMIN13569

To appear in: *Journal of Luminescence*

Received date: 21 April 2015
Revised date: 7 August 2015
Accepted date: 14 August 2015

Cite this article as: Lokesh Mishra, Anchal Sharma, Amit K. Vishwakarma, Kaushal Jha, M. Jayasimhadri, B.V. Ratnam, Kiwan Jang, A.S. Rao and R.K. Sinha, White Light Emission and Color Tunability of Dysprosium doped Barium Silicate Glasses, *Journal of Luminescence,* http://dx.doi.org/10.1016/j.jlumin.2015.08.063

White Light Emission and Color Tunability of Dysprosium doped Barium Silicate Glasses

Lokesh Mishra[1], Anchal Sharma[1], Amit K. Vishwakarma[1], Kaushal Jha[1], M. Jayasimhadri[1,]*, B.V. Ratnam[2], Kiwan Jang[2], A.S. Rao[1], R.K. Sinha[1]

[1]*Department of Applied Physics, Delhi Technological University, Delhi - 110042, India*

[2]*Department of Physics, Changwon National University, Changwon, Korea 641-773*

Abstract

The present work elucidates the synthesis of Dy^{3+} doped barium silicate glasses, along with subsequent studies performed to evaluate its viability in solid state lighting applications. The synthesized photonic glasses were investigated via X-ray diffraction, scanning electron microscopy and fourier transform infrared spectroscopy. The photoluminescence properties were examined under ultraviolet (UV)/near UV (NUV) excitation. Photoluminescence spectrum exhibited characteristic emission bands at λ_{em}= 483 nm (blue) and λ_{em}= 576 nm (yellow) which are ascribed to the $^4F_{9/2}\rightarrow{}^6H_{15/2}$ and $^4F_{9/2}\rightarrow{}^6H_{13/2}$ transitions of Dy^{3+} ion, respectively. The chromaticity coordinates under excitation of λ_{ex}= 348 nm are (0.31, 0.34), which lies in the white region of CIE 1931 chromaticity diagram and are in excellent proximity with the standard equal energy white illuminant (0.333, 0.333). The calculated correlated color temperature and the yellow to blue (Y/B) ratio are found to be 6602 K and 1.12, respectively for the optimized sample. The synthesized photonic glass also offered the possibility of tuning the color as exemplified through the variation in CIE coordinates, correlated color temperature and the Y/B ratio. The results confirm the possibility of color tunability from the proposed glass and may be useful for various photonic device applications.

Keywords: Photoluminescence, Silicate glass, FT-IR, w-LEDs

---

*E- mail: jayaphysics@yahoo.com (M. Jayasimhadri); Tel.: +91 9013553360