

Photoluminescence in $\text{NaCa}_2\text{Br}_5:\text{Eu}^{2+}$ Novel Phosphor.

Mungmode CD^{1*}, Gahane DH², Tupte BV³, Moharil SV⁴

¹M. G. College, Armori, 441208, India

²N. H. College, Bramhapuri, 441206, India

³S.G.M. College, Kurkheda, 441209, India

⁴R.T.M. Nagpur University, Nagpur, 440010, India

Email: mungmode.prashant@gmail.com

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ABSTRACT

A simple procedure to prepare Eu^{2+} activated bromide phosphor NaCa_2Br_5 is described. Sample was synthesized by simple low temperature wet chemical method. Photoluminescence (PL) results showed that the phosphor can be efficiently excited by UV-visible light from 200 to 430 nm and exhibited bright blue emission around 435 nm when excited by 365 nm near-ultraviolet light. The developed phosphor emits in blue and hence could provide one of the three primary colour components in phosphor converted LED producing white light.

Keywords: Solid State Lighting, wet chemical synthesis, blue phosphor, photoluminescence

INTRODUCTION

Solid state lighting have a very bright future in various lighting applications because of their high energy efficiency and cost effectiveness compared to incandescent bulbs. It has the potential to make much more progress over the coming decade. A very effective way to produce white light from UV/blue LED is by coating on LED suitable phosphors excitable by LED light, so that white light is produced either by mixing of basic colours or complementary colours. Blue is at the short-wavelength (high-energy) end of the visible spectrum, it proved possible to "down convert" blue light into green, yellow and even red light using passive phosphorescent and fluorescent materials [1].

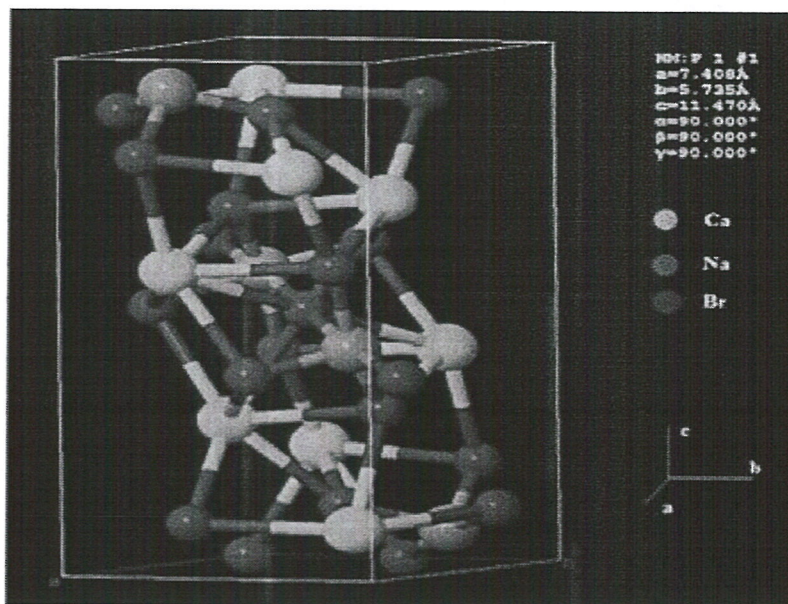


Fig. 1 Unit Cell of NaCa_2Br_5

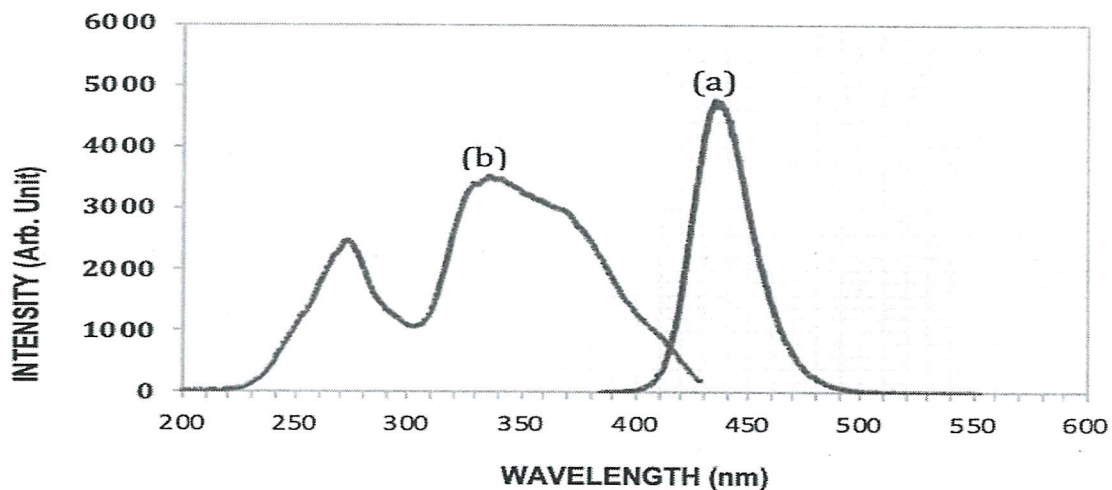


Fig. 2 Photoluminescence Spectrum of Eu^{2+} activated NaCa_2Br_5 phosphor
 (a) Emission Spectra of $\text{NaCa}_2\text{Br}_5: \text{Eu}^{2+}$ for 365 nm excitation.
 (b) Excitation spectra of $\text{NaCa}_2\text{Br}_5: \text{Eu}^{2+}$ for 435 nm emission.

CONCLUSION

A simple wet chemical method for the synthesis of Eu^{2+} activated NaCa_2Br_5 phosphors is described. Efficient luminescence is observed near 435 nm in blue violet region with excitation in the near UV range. It is suggested that this result will be significant for developing phosphors with near UV excitations needed in applications such as solid state lighting.

Conflicts of interest: The authors stated that no conflicts of interest.

REFERENCES

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