

Blue luminescent materials containing Eu^{2+} and Dy^{3+} ions doped in barium aluminate: preparation and optical properties.

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Abstract – Barium aluminate: $\text{Eu}^{2+}, \text{Dy}^{3+}$ was prepared by solid state reaction and submitted at the thermal treatment of 1000 °C for 5 h. The influence of the temperature on the structure, coloration, stability and homogeneity were investigated by X-Ray diffraction, infrared spectroscopy and luminescence spectroscopy. The goal of this work is the preparation of the compound by the traditional ceramic processing in air and to provide a new blue phosphor.

Rare Earths (RE) are used extensively in luminescent materials which employ practically any kind of energy as the excitation source. Non-doped rare earth compounds with well-defined stoichiometry can be employed, but most frequently the rare earths enter as dopants into different host matrices [1,2].

In order to avoid any decrease in efficiency, a very good homogeneity is then required of the crystal lattice [3]. The thermal treatment posterior affects strongly the luminescence coloration obtaining blue color at 1000° C. This work proposes the thermal treatment to develop a blue phosphor. X-ray diffraction, scanning electronic microscopy, infrared and photoluminescence spectra will be employed to analyze the formation of this compound.

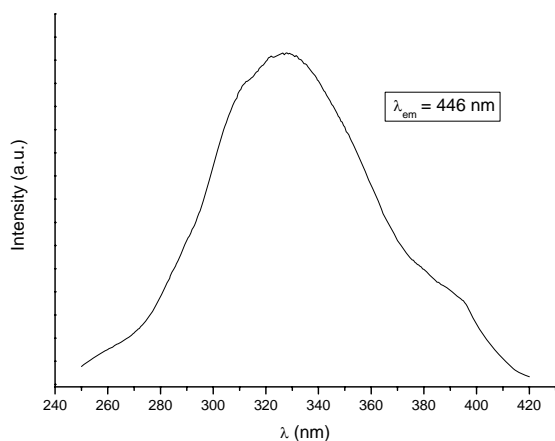


Figure 1: Excitation spectrum of the compound

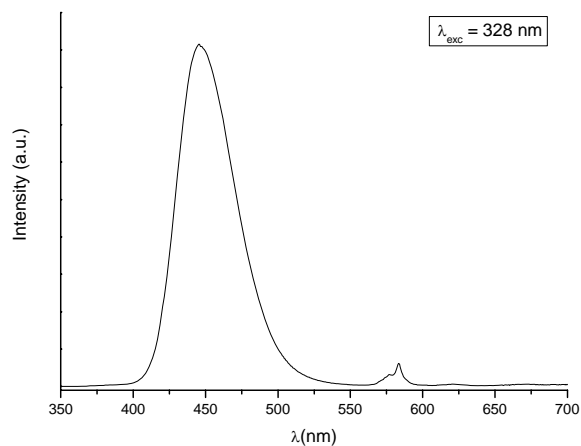


Figure 2: Emission spectrum of the compound

References

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