

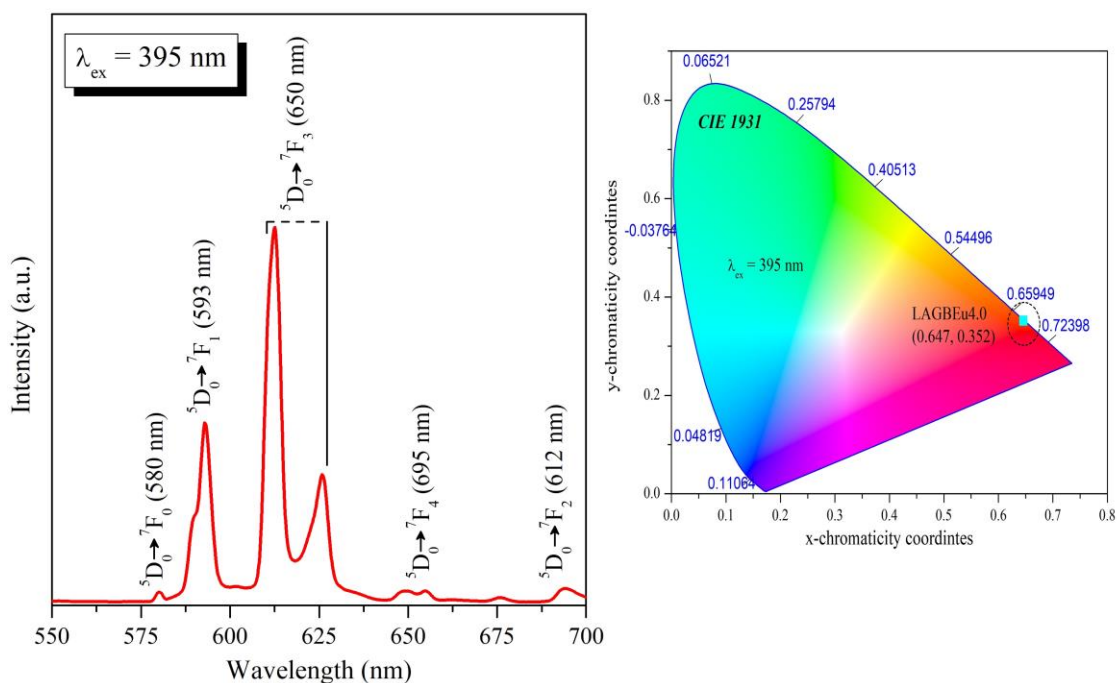
Li₆AlGd(BO₃)₄: Eu³⁺ red emitting phosphors for lighting applications

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The Li₆AlGd(BO₃)₄:xEu³⁺ phosphors were synthesized by solid state reaction technique [1]. The crystalline phase, morphology and optical properties were investigated. The excitation wavelength was optimized to be 395 nm and the concentration of Eu³⁺ was optimized as 4.0 mol% for intense red emission. When excited at 395 nm radiation, the Li₆AlGd(BO₃)₄:xEu³⁺ phosphors exhibit intense red emission through ⁵D₀ → ⁷F₀, ⁵D₀ → ⁷F₁, ⁵D₀ → ⁷F₂, ⁵D₀ → ⁷F₃ and ⁵D₀ → ⁷F₄ transitions [2]. The figure illustrates the emission spectrum and CIE diagram of Li₆AlGd(BO₃)₄:4.0 mol% of Eu³⁺ phosphor. The luminescence thermal resistance was examined by studying the temperature dependence luminescence at 395 nm excitation. The quantum efficiency was estimated using the integrated intensity of emission peaks and decay time. The experimental observations show that the Li₆AlGd(BO₃)₄:4.0 mol% of Eu³⁺ phosphor has greater proficiency in the design of lighting devices.



References

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- [2] W.T. Carnall, P.R. Fields, and K. Rajnak, J. Chem. Phys. 49 (1968) 4450-4455. DOI: <https://doi.org/10.1063/1.1669896>