

Host Composition Effect on Luminescence Properties of $\text{LaSr}_2\text{AlO}_5\text{:Ce}$ Yellow phosphor prepared by spray pyrolysis

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For the last two decades, white light-emitting diodes (LEDs) have been the subject of increasing interest due to their advantages of low energy consumption, long lifetime, lack of pollutants such as mercury and their potential applications in backlight of display devices, automobile headlights and general illumination. Currently, most commercial LED lamps employ yellow-emitting $\text{Y}_3\text{Al}_5\text{O}_{12}\text{:Ce}^{3+}$ (YAG:Ce³⁺) phosphor excited by blue InGaN diodes. This white light LED fabricated with YAG:Ce³⁺, however, cannot create warm white light with high color rendering index (CRI) due to the phosphor emitting greenish yellow light. Therefore, In this work a potential yellow phosphor, $\text{LaSr}_2\text{AlO}_5\text{:Ce}$, was prepared by spray pyrolysis and the host compositions were controlled to design the luminescence properties. First, Ce content was optimized, and Gd and B elements also were incorporated into La and Al sites, respectively. The prepared samples were analyzed by X-ray diffraction (XRD), the photoluminescence and reflectance.