

## Synthesis and optical properties of Tb<sup>3+</sup>-doped LaSrAl<sub>3</sub>O<sub>7</sub> phosphors

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### Abstract

A solution combustion route for the synthesis of Tb<sup>3+</sup>-activated LaSrAl<sub>3</sub>O<sub>7</sub> and their photoluminescent properties have been investigated using glycine as a fuel. Structure and optical properties of LaSrAl<sub>3</sub>O<sub>7</sub>:Tb<sup>3+</sup> perovskites nanophosphors have been studied by x-ray diffraction, scanning electron microscopy, fluorescence spectrometry and Fourier transform infra-red spectroscopy. The X-ray diffraction patterns (XRD) showed that a pure LaSrAl<sub>3</sub>O<sub>7</sub> phase was obtained at 1000°C and the crystal size was also calculated. The incorporation of Tb<sup>3+</sup> activator in these nanoparticles has been checked by luminescence characteristics. Monitoring at 545 nm, the excitation spectrum consists of a broad band and a series of narrow peaks in the higher wavelength region. This phosphor material displayed excellent green color due to Tb<sup>3+</sup> ions characteristic transition <sup>5</sup>D<sub>4</sub> → <sup>7</sup>F<sub>5</sub> at 545 nm under near UV light excitation. In addition, the optimal Tb<sup>3+</sup>-doped contents of LaSrAl<sub>3</sub>O<sub>7</sub> phosphor was also studied.

**Keywords:** - Luminescence; Optical properties, LaSrAl<sub>3</sub>O<sub>7</sub>: Tb

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