



Contribution ID: 271

Type: Poster

LUMINESCENCE PROPERTIES OF CORDIERITE RED-EMITTING PHOSPHOR PREPARED BY COMBUSTION SYNTHESIS FOR APPLICATIONS IN WHITE-LIGHT ILLUMINATION LEDS

There is a need to develop composite phosphors for white-emitting lamps based on blue LEDs that can be efficiently activated and generate light with high color rendering index (CRI). In particular, there are only few red-emitting luminescent materials excited with blue photons for CRI improvement of the illumination devices. In this investigation, we report a two-stage energy-efficient methodology to fabricate Eu-doped α -cordierite red-emitting phosphors. The first stage of the process consists in the preparation of a spinel-phase (MgAl_2O_4) and SiO_2 mixture by using low-temperature combustion synthesis. Post-annealing treatment at 1350°C for just 1 hour in a reducing atmosphere is employed as the second stage to obtain α - $\text{Mg}_2\text{Al}_4\text{Si}_5\text{O}_{18}:\text{Eu}^{2+}$. When blue light (465 nm) was used as the excitation source the cordierite phosphor powders yielded a broad red emission peak centered around 617 nm making this material a robust red-emitting phosphor and a potential candidate for integration with YAG:Ce to improve CRI in white-emitting LED lamps. On the other hand, the photoluminescence spectrum of α - $\text{Mg}_2\text{Al}_4\text{Si}_5\text{O}_{18}:\text{Eu}^{2+}$ displayed a broad blue emission band peaking at 465-488 nm under UV (365 nm) excitation.

Keywords

Red-emitting phosphor, combustion synthesis, cordierite, LED, illumination

Reference

no reference

This work was supported by

CONAHCYT PhD scholarship

Author approval

I confirm

Author will attend

I confirm

Primary authors: Mr MIRIDONOV, Alexei (Department of Optics. Center for Scientific Research and Higher Education at Ensenada, Baja California. Carretera Ensenada-Tijuana No.3918, Ensenada, B.C., C.P. 22860, México.); HIRATA, Gustavo (Physicochemistry of Nanomaterials. Center of Nanoscience and Nanotechnology, Au-

tonomous University of Mexico, Km 107 Carretera Tijuana –Ensenada Apdo Postal 14, CP. 22800 Ensenada, BC. México.); Dr MÁRQUEZ, Heriberto (Department of Optics. Center for Scientific Research and Higher Education at Ensenada, Baja California. Carretera Ensenada-Tijuana No.3918, Ensenada, B.C., C.P. 22860, México.)

Presenter: Mr MIRIDONOV, Alexei (Department of Optics. Center for Scientific Research and Higher Education at Ensenada, Baja California. Carretera Ensenada-Tijuana No.3918, Ensenada, B.C., C.P. 22860, México.)

Session Classification: LUMINESCENCE PHENOMENA

Track Classification: Luminescence Phenomena: Materials and Applications