

Accepted Manuscript

Color tunable emission and energy transfer of Ce³⁺/Dy³⁺ codoped Ba₃La₂(BO₃)₄ phosphor for UV white LEDs

Fen Xiao, Rongxi Yi, Huiling Yuan, Guanjian Zang, Chengning Xie



PII: S1386-1425(18)30451-7
DOI: doi:[10.1016/j.saa.2018.05.061](https://doi.org/10.1016/j.saa.2018.05.061)
Reference: SAA 16095

To appear in: *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*

Received date: 1 December 2017
Revised date: 11 May 2018
Accepted date: 15 May 2018

Please cite this article as: Fen Xiao, Rongxi Yi, Huiling Yuan, Guanjian Zang, Chengning Xie , Color tunable emission and energy transfer of Ce³⁺/Dy³⁺ codoped Ba₃La₂(BO₃)₄ phosphor for UV white LEDs. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Saa(2017), doi:[10.1016/j.saa.2018.05.061](https://doi.org/10.1016/j.saa.2018.05.061)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Color tunable emission and energy transfer of $\text{Ce}^{3+}/\text{Dy}^{3+}$ codoped $\text{Ba}_3\text{La}_2(\text{BO}_3)_4$ phosphor for UV white LEDs

Fen Xiao, Rongxi Yi, Huiling Yuan, Guanjian Zang, Chengning Xie*

College of Mechanical and Electrical Engineering, Jinggangshan University, Ji'an, 343009, China

Abstract

Polycrystalline $\text{Ba}_3\text{La}_2(\text{BO}_3)_4:\text{Ce}^{3+},\text{Dy}^{3+}$ sub-micrometer-sized phosphors were synthesized by solid-state reaction under a weak reductive atmosphere. The structure, static and time-resolved photoluminescence are investigated. Under the near-ultraviolet excitation, the $\text{Ba}_3\text{La}_2(\text{BO}_3)_4:\text{Dy}^{3+}$ phosphors emit white light with three intense emission bands centered at 483, 575, and 665 nm. The efficient energy transfer from Ce^{3+} to Dy^{3+} in $\text{Ba}_3\text{La}_2(\text{BO}_3)_4$ phosphor was found by excitation/emission spectra and decay time measurements, and the resonant type was demonstrated by a dipole-dipole mechanism. A tunable emission hue from blue (0.18, 0.20) to blue-white (0.26, 0.29) and eventually to white (0.32, 0.33) was obtained in $\text{Ba}_3\text{La}_2(\text{BO}_3)_4:\text{Ce}^{3+},\text{Dy}^{3+}$ phosphors. Owing to the broad UV excitation band, indicating that $\text{Ba}_3\text{La}_2(\text{BO}_3)_4:\text{Ce}^{3+},\text{Dy}^{3+}$ phosphors can be considered as a potential candidate for ultraviolet-based white light-emitting diodes.

Keywords: Phosphor; Luminescence; Borate; Energy transfer.

* To whom correspondence should be addressed, electronic mail: stevexiecn@gmail.com

Download English Version:

<https://daneshyari.com/en/article/7668034>

Download Persian Version:

<https://daneshyari.com/article/7668034>

[Daneshyari.com](https://daneshyari.com)