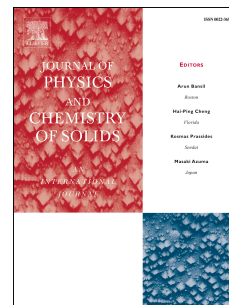


Accepted Manuscript

Tunable emission in Ln^{3+} ($\text{Ce}^{3+}/\text{Dy}^{3+}$, $\text{Ce}^{3+}/\text{Tb}^{3+}$) doped $\text{KNa}_3\text{Al}_4\text{Si}_4\text{O}_{16}$ phosphor for w-LEDs synthesized by combustion method

M.M. Kolte, V.B. Pawade, A.B. Bhattacharya, S.J. Dhoble



PII: S0022-3697(17)31968-6

DOI: [10.1016/j.jpcs.2018.02.004](https://doi.org/10.1016/j.jpcs.2018.02.004)

Reference: PCS 8418

To appear in: *Journal of Physics and Chemistry of Solids*

Received Date: 14 October 2017

Revised Date: 1 January 2018

Accepted Date: 2 February 2018

Please cite this article as: M.M. Kolte, V.B. Pawade, A.B. Bhattacharya, S.J. Dhoble, Tunable emission in Ln^{3+} ($\text{Ce}^{3+}/\text{Dy}^{3+}$, $\text{Ce}^{3+}/\text{Tb}^{3+}$) doped $\text{KNa}_3\text{Al}_4\text{Si}_4\text{O}_{16}$ phosphor for w-LEDs synthesized by combustion method, *Journal of Physics and Chemistry of Solids* (2018), doi: 10.1016/j.jpcs.2018.02.004.

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.

Tunable emission in Ln^{3+} ($\text{Ce}^{3+}/\text{Dy}^{3+}$, $\text{Ce}^{3+}/\text{Tb}^{3+}$) doped $\text{KNa}_3\text{Al}_4\text{Si}_4\text{O}_{16}$ phosphor for w-LEDs synthesized by combustion method

¹M.M.Kolte, ²V.B.Pawade, ³A B. Bhattacharya, ¹S.J.Dhoble

^{1,3}Department of Physics, R.T.M. Nagpur University, Nagpur-33, India

²Department of Applied-Physics, Laxminarayan Institute of Technology, Nagpur-33, India

³Department of Industrial Chemistry and Applied Chemistry, Swami Vivekananda Research Center, Ramakrishna Mission Vidyamandira, Belurmath, Howrah-711202, India

Abstract

Ln^{3+} ($\text{Ln} = \text{Ce}^{3+}/\text{Dy}^{3+}$, $\text{Ce}^{3+}/\text{Tb}^{3+}$) doped $\text{KNa}_3\text{Al}_4\text{Si}_4\text{O}_{16}$ phosphor has been synthesized by Combustion Synthesis (CS) at 550°C successfully. Ln^{3+} ($\text{Ln} = \text{Ce}^{3+}$, Dy^{3+} , Tb^{3+}) ions when doped in $\text{KNa}_3\text{Al}_4\text{Si}_4\text{O}_{16}$ host lattice, it shows blue and green emission band under the near Ultraviolet (NUV) excitation wavelength. The Photoluminescence excitation (PLE) and emission spectra are observed due to f-f and d-f transition of rare earth ions. Also, an effective energy transfer (ET) study from $\text{Ce}^{3+} \rightarrow \text{Dy}^{3+}$ and $\text{Ce}^{3+} \rightarrow \text{Tb}^{3+}$ ions have been studied and confirmed on the basis of Dexter-Foster theory. Further synthesized phosphor is well characterized by XRD, SEM, TEM and decay time measurement. However, the analysis of crystallite size, lattice strain has been studied by using theoretical as well as experimental techniques. Hence, the observed tunable emission in Ln^{3+} doped $\text{KNa}_3\text{Al}_4\text{Si}_4\text{O}_{16}$ phosphor may be application for solid state lighting technology.

Keywords:

Phosphor

Materials and methods

Crystallite Size

Nanomaterials

Energy transfer

Decay time

Corresponding author: vijaypawade003@gmail.com

Contact No: +919823232068

Download English Version:

<https://daneshyari.com/en/article/7920588>

Download Persian Version:

<https://daneshyari.com/article/7920588>

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