

## Accepted Manuscript

Title: Annealing effects on the luminescence properties of Ce doped  $\text{ZnAl}_2\text{O}_4$  produced by combustion synthesis

Authors: Vijay Singh, N. Singh, M.S. Pathak, Vikas Dubey, Pramod K. Singh



PII: S0030-4026(17)31380-3  
DOI: <https://doi.org/10.1016/j.ijleo.2017.10.167>  
Reference: IJLEO 59903

To appear in:

Received date: 22-8-2017  
Accepted date: 27-10-2017

Please cite this article as: Vijay Singh, N.Singh, M.S.Pathak, Vikas Dubey, Pramod K.Singh, Annealing effects on the luminescence properties of Ce doped  $\text{ZnAl}_2\text{O}_4$  produced by combustion synthesis, Optik - International Journal for Light and Electron Optics <https://doi.org/10.1016/j.ijleo.2017.10.167>

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.

# Annealing effects on the luminescence properties of Ce doped $\text{ZnAl}_2\text{O}_4$ produced by combustion synthesis

Vijay Singh <sup>a,\*</sup>, N. Singh <sup>a</sup>, M. S. Pathak <sup>a</sup>, Vikas Dubey <sup>b</sup>, Pramod K. Singh <sup>c</sup>

<sup>a</sup> Department of Chemical Engineering, Konkuk University, Seoul 143-701, Republic of Korea

<sup>b</sup> Department of Physics, Bhilai Institute of Technology, Raipur, Kendri, 49366, India

<sup>c</sup> Materials Research Laboratory, Sharda University, Greater Noida, 201310, India

---

\*Corresponding authors:

Email addresses: vijayjiin2006@yahoo.com (V. Singh)

## Abstract

$\text{ZnAl}_2\text{O}_4$  doped with varying concentrations of cerium phosphors were synthesized by combustion synthesis route. Two types of powder samples were examined: as-prepared and annealed at 800°C in air atmosphere. We investigated the structural, morphological and photoluminescence properties of cerium doped  $\text{ZnAl}_2\text{O}_4$  phosphors. Results of scanning electron microscopy, X-ray diffraction, photoluminescence investigations were presented.

**Keywords:** Phosphor,  $\text{Ce}^{3+}$ ,  $\text{ZnAl}_2\text{O}_4$ , Combustion, Annealing

## 1. Introduction

Zinc aluminate spinel ( $\text{ZnAl}_2\text{O}_4$ ) is a naturally available mineral commonly called gahnite.  $\text{ZnAl}_2\text{O}_4$  is a mixed oxide of aluminum and zinc and its crystal structure belongs to spinel group. A general formula of spinels is  $\text{AB}_2\text{O}_4$ , where A and B denote di and tri valent cations, respectively [1, 2].  $\text{ZnAl}_2\text{O}_4$  has been widely used as catalyst [3], ceramic [4] and electronic [5] material. Moreover, several studies have found the incorporation of rare earth and transition metal into the  $\text{ZnAl}_2\text{O}_4$  lattice [6-10]. For application in display technologies,  $\text{ZnAl}_2\text{O}_4$  was studied as host lattice for trivalent rare-earth ions such as  $\text{Tb}^{3+}$ , [11]  $\text{Eu}^{3+}$  [12]

Download English Version:

<https://daneshyari.com/en/article/7225293>

Download Persian Version:

<https://daneshyari.com/article/7225293>

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