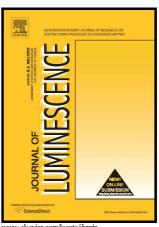
Author's Accepted Manuscript

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www.elsevier.com/locate/ilumin

PII: S0022-2313(17)32186-5

https://doi.org/10.1016/j.jlumin.2018.05.017 DOI:

Reference: **LUMIN15599**

Journal of Luminescence To appear in:

Received date: 19 December 2017

Revised date: 4 May 2018 Accepted date: 7 May 2018

Cite this article as: S. Ponkumar, K. Janaki, D. Prakashbabu, M. Madesh Kumar and M. Madhusudana Reddy, Flux influenced morphology tailoring and emission color tuning to pure white in ZrO₂:Eu³⁺phosphors, Journal of Luminescence, https://doi.org/10.1016/j.jlumin.2018.05.017

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Flux influenced morphology tailoring and emission color tuning to pure white

in ZrO₂:Eu³⁺phosphors

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Abstract

Influence of volatile fluxes like NH₄Cl, B(OH)₃ and their combination on the photo

luminescence and morphological properties of ZrO₂:Eu³⁺ phosphor was investigated. The

samples were characterized by XRD, UV-Vis spectroscopy, scanning electron microscopy and

photoluminescence spectra. XRD pattern shows that the samples prepared using ammonium

chloride and by combination of ammonium chloride, boric acid crystallizes in tetragonal phase,

whereas samples prepared without flux and using boric acid, crystallizes in cubic phase. The

results revealed that particle size, morphology, phase and photoluminescence emission color

were largely influenced by the flux. Type of flux employed significantly influenced the

morphology and emission color of the phosphor. Addition of two fluxes resulted in pure white-

light emission, with CIE chromaticity coordinates of (0.327, 0.331), which is very close to the

essential requirement to the NTSC (National Television System Committee) system for

standard white light.

Keywords: phosphors; XRD; CIE; W-LEDs; SEM;

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