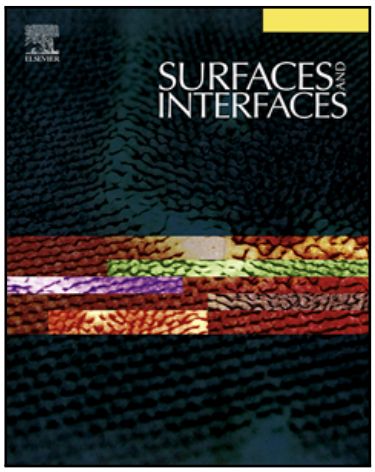

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PII: S2468-0230(18)30111-1
DOI: 10.1016/j.surfin.2018.02.008
Reference: SURFIN 184

To appear in: *Surfaces and Interfaces*

Received date: 7 November 2017
Revised date: 24 January 2018
Accepted date: 25 February 2018

Please cite this article as: Shoaib Akbar , Kashif Yaqub , Sumaira Zeeshan , Usman Raza , Sumera Javeed , Sumera Yamin , Zahid Asghar , Masood Ahmed , Manzoor Ahmed , Surface and Electro-Luminescence Characterization of Cerium Doped Yttrium Aluminium Garnet Produced by Spray and Electrophoretic deposition Techniques, *Surfaces and Interfaces* (2018), doi: 10.1016/j.surfin.2018.02.008

Surface and Electro-Luminescence Characterization of Cerium Doped Yttrium Aluminium Garnet Produced by Spray and Electrophoretic deposition Techniques

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Abstract

Cerium doped Yttrium Aluminum Garnet (YAG: Ce) coatings; produced by spray deposition and electrophoretic techniques, are characterized for their surface morphology and electro-luminescence. The surface morphology of synthesized samples shows that samples manufactured by electrophoretic deposition technique have remarkable surface properties having average surface roughness of 0.23 μm. The electron beam of variable energy (1-3 keV) is used to study the electro-luminescence. The emission spectra are recorded using Ocean optics Spectrometer (HR 2000), which depicts that emission intensity increases with increase in coating thickness of samples manufactured by spray deposition technique and with increase in dopant concentration of samples manufactured by electrophoretic deposition technique. The anomalous trend in emission intensity of samples prepared by spray deposition is observed due to the irregular morphology and high surface roughness. The coatings manufactured by electrophoretic deposition show superior electro luminescence; with 67-92% higher efficiency than the films produced by spray deposition, for the same range of electron energies.

Keywords: Electron Beam Diagnostics, YAG: Ce, Spray deposition, Electrophoretic, Emission Spectroscopy

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