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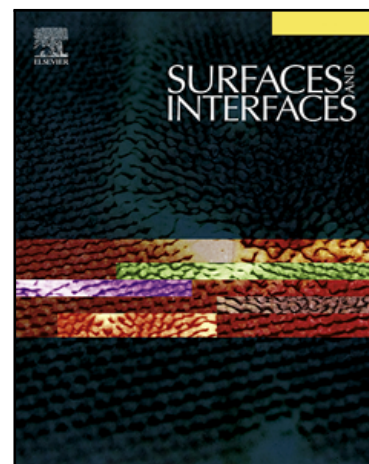
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Surface and Electro-Luminescence Characterization of Cerium Doped Yttrium Aluminium Garnet Produced by Spray and Electrophoretic deposition Techniques

Shoaib Akbar^{a,b*}, Kashif Yaqub^a, Sumaira Zeeshan^a, Usman Raza^b,
Sumera Javeed^a, Sumera Yamin^a, Zahid Asghar^c, Masood Ahmed^d,
Manzoor Ahmed^b

^a LINAC Division, Directorate of Technology, PINSTECH, P.O Nilore, Islamabad,
Pakistan

^b Pakistan Institute of Engineering and Applied Sciences, Nilore, Islamabad, Pakistan

^c Material Division, Directorate of Technology, PINSTECH, P.O Nilore, Islamabad,
Pakistan

^d Institute of Space Technology, Islamabad, Pakistan

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

*Corresponding author.

Email address: shoaib.akbar554@gmail.com

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