

## Low voltage cathodoluminescence of Zn co-doped RGB phosphors for Field Emission Displays (FEDs) applications

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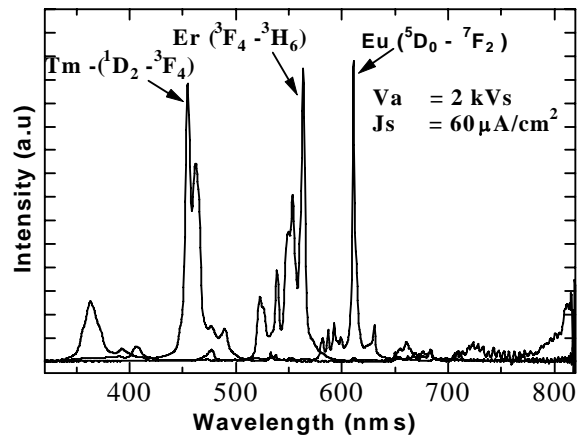
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### Abstract

Cathodoluminescence of Zn co-doped  $Y_2O_3$ -Eu, Er and Tm were studied as red, green and blue phosphors, respectively, at low voltage excitation ( $<2$  kVs) for the possible application in field emission displays (FEDs). The co-doping of Zn and rare earth elements in  $Y_2O_3$  was achieved by citric acid sol-gel method. CL luminance and chromaticity of the red, green and blue emission were improved by co-doping of Zn in  $Y_2O_3$  lattice. It was observed that addition of Zn (5 mol%) in the  $Y_2O_3$  increase the conductivity, crystallinity and shows a strong narrow band emission peaked at 390 nm. This near UV emission is found to increase as a function of current density and excitation voltage. The UV emission peak is quenched by addition of rare earths viz, Eu, Er and Tm and shows an improvement of 30-40 % in cathodo-luminescence intensity at red and blue region, respectively, compared with Zn undoped phosphor.



**Fig.1.** CL emission spectra of Zn co-doped  $Y_2O_3$  with Eu, Er and Tm at the excitation voltage of 2 kVs and  $60 \mu A/cm^2$ .