Electronic Supplementary Material (ESI) for RSC Advances.

Eu^{3+} Local Site Analysis and Emission Characteristics of Novel $Nd_2Zr_2O_7$:Eu phosphor- An Insight into the Effect of Europium Concentration on its Photoluminescence Properties

Santosh K. Gupta[a*], C. Reghukumar[b], R.M. Kadam[a]

a. Radiochemistry Division, Bhabha Atomic Research Centre Trombay, Mumbai-400085, India

b. Institute of science education and research Centre, Santiniketan, West Bengal -731235, India

*Corresponding Author- santoshg@barc.gov.in, santufrnd@gmail.com

Telephone- +91-22-25590636

Fax- +91-22-25505151

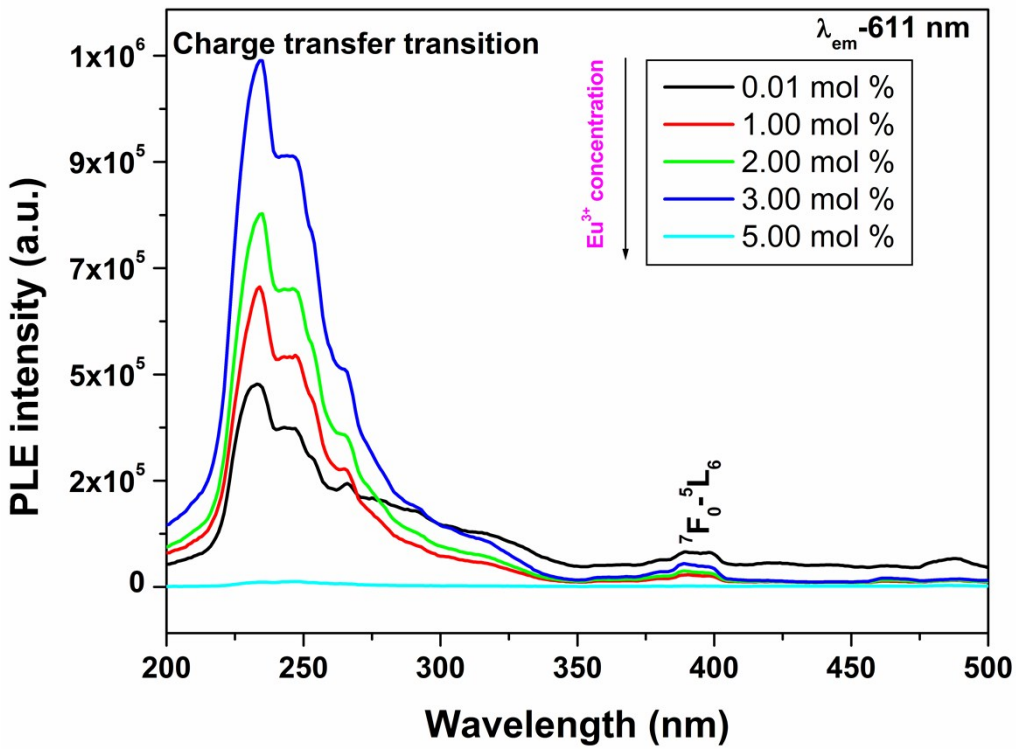

Figure S1: Effect of europium ion concentration on excitation spectra of $Nd_2Zr_2O_7$: Eu^{3+}

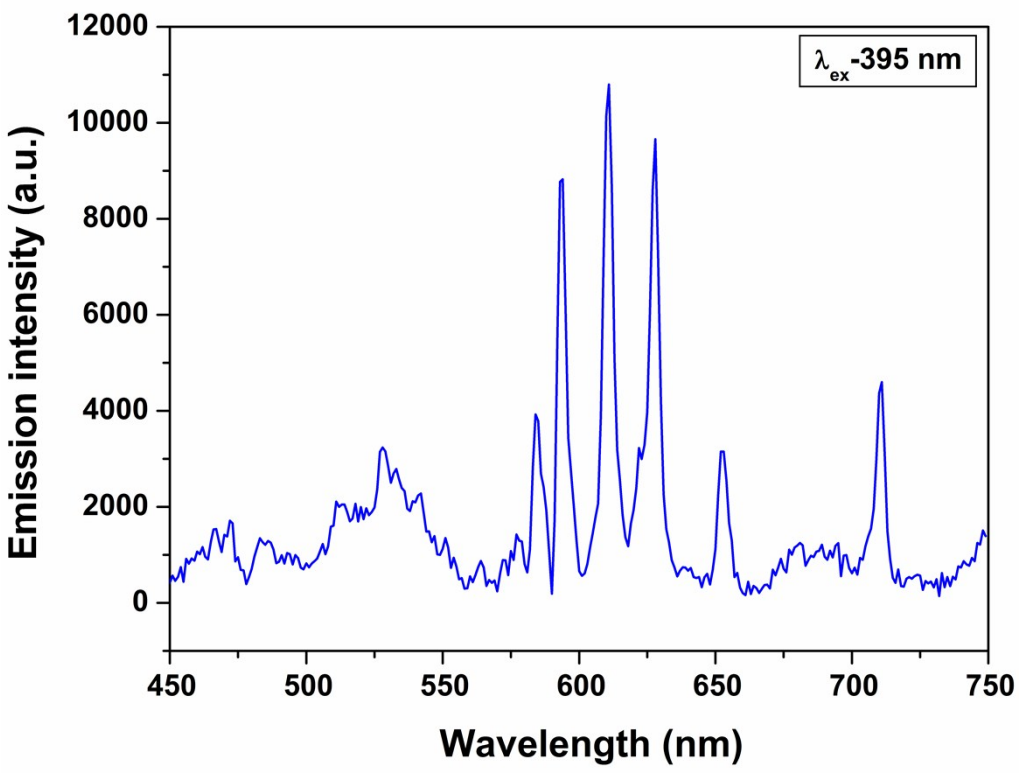

Figure S2: Emission spectrum of $Nd_2Zr_2O_7$: Eu^{3+} (0.01 %) under 395 nm excitation

I-1: Procedure data slicing in TRES

- Supposing there are two components A (short lived) and B (long lived), first we record the composite spectrum (A+B) with very short delay (just to avoid the lamp profile).
- Then give sufficient delay and record with identical integration times so that there is only B component in the spectrum (let's say B'; A is already decayed).
- But the intensity of the B' which we would get is not the same as the original B in the composite spectrum (A+B).
- So we multiply a suitable multiplying factor (exp factor, $e^{-t/\tau}$) so as to get the original intensity of B.
- Then if we subtract this B from the composite spectrum (A+B), it is possible to get the short lived component A.
- One has to maintain however same gate widths while dealing with this type of procedure.

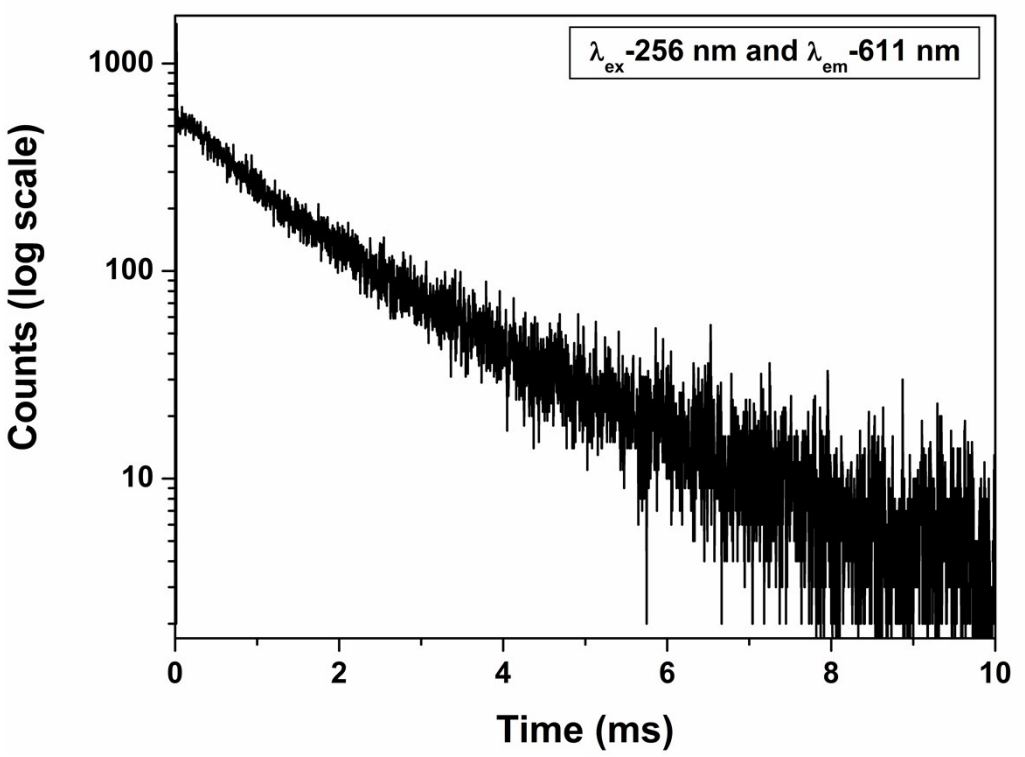

Figure S3: Lifetime decay profile $Nd_2Zr_2O_7$: Eu^{3+} (5.0 %) under 256 nm excitation and 611 nm emission.