Physical Chemistry Chemical Physics

SUPPORTING INFORMATION

Novel strategy for the controllable emissions from Eu^{3+} or Sm^{3+} ions co-doped SrY_2O_4: Tb^{3+} phosphor

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Characterizations

X-ray diffraction (XRD) patterns of the SrY_2O_4(SY) samples were recorded on X' PERT-MPD X-ray diffractometer with CuK_α=1.5406Å. The morphology of the samples was examined by field emission scanning electron microscope (ZEISS-FESEM, SUPRA 55). Osmium coating was sprayed on the sample surfaces using a fine coat ion sputter E-1010 unit to avoid possible charging of specimens before SEM observation was made on each time. The room temperature PL spectra were recorded on a fluorimeter (PTI: Photon Technology International USA) with a Xe-arc lamp of power 60 W. The CL properties were measured by a Gatan (UK) MonoCL3 system attached with the SEM (Hitachi S-4300 SE)

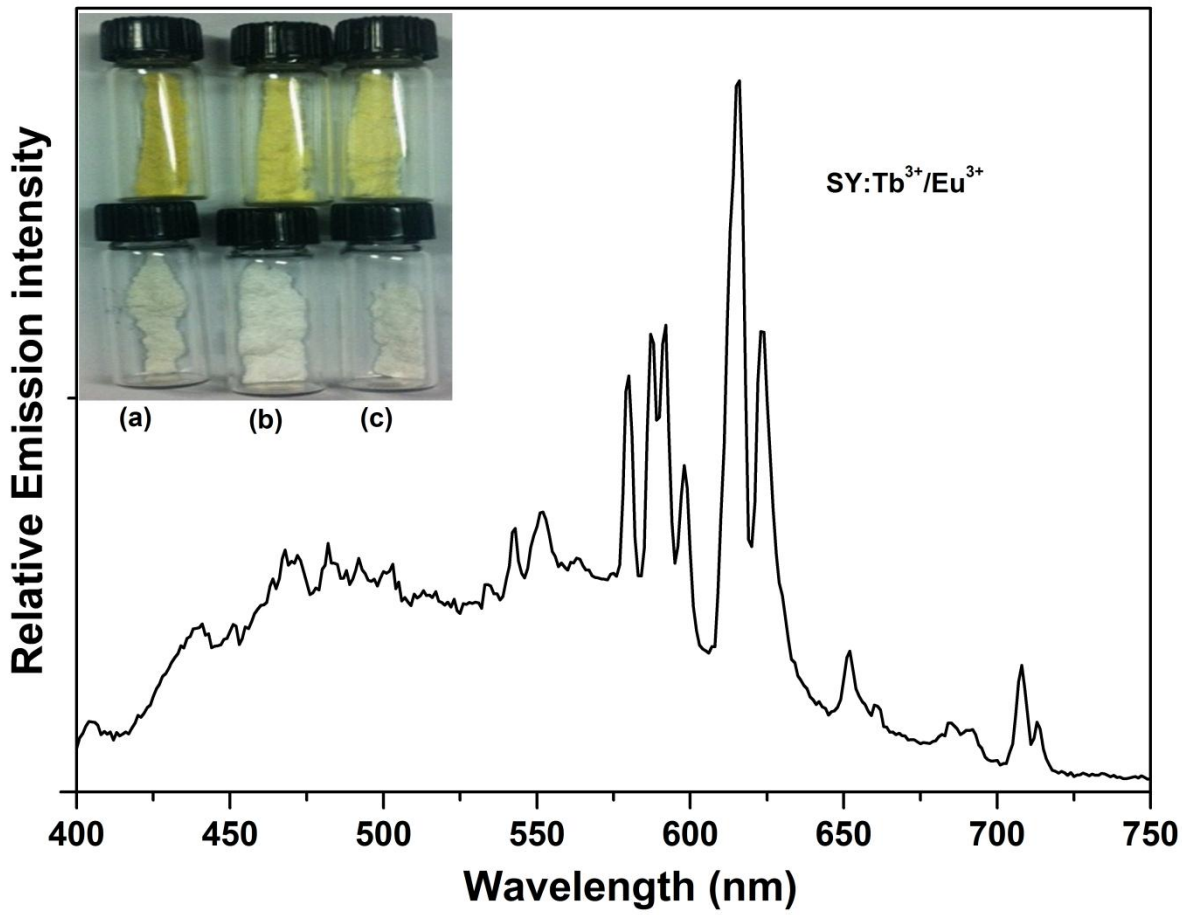

Fig. S1. PL spectrum of Eu^{3+} co-doped SY: Tb^{3+} phosphor before annealing in reducing atmosphere (Photograph shows the before reduction (yellow color) and after reduction (white color) (a) pure Tb doped SY (b) Eu^{3+} co-doped SY: Tb^{3+} and (c) Sm^{3+} co-doped SY: Tb^{3+})

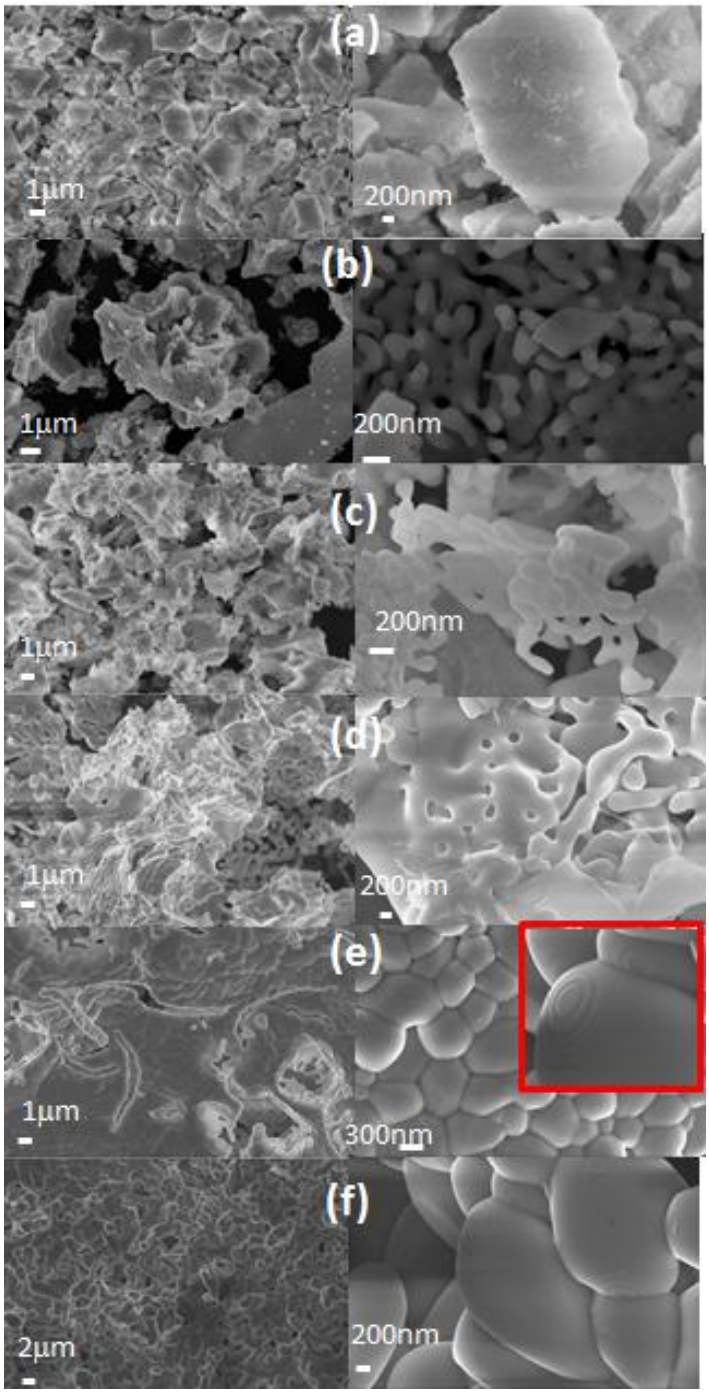

Fig. S2. SEM and corresponding magnified images of SY phosphor at different annealing temperatures [(a) 700, (b)900, (c)1000, (d)1200, (e) 1300 and (f) 1400 °C]

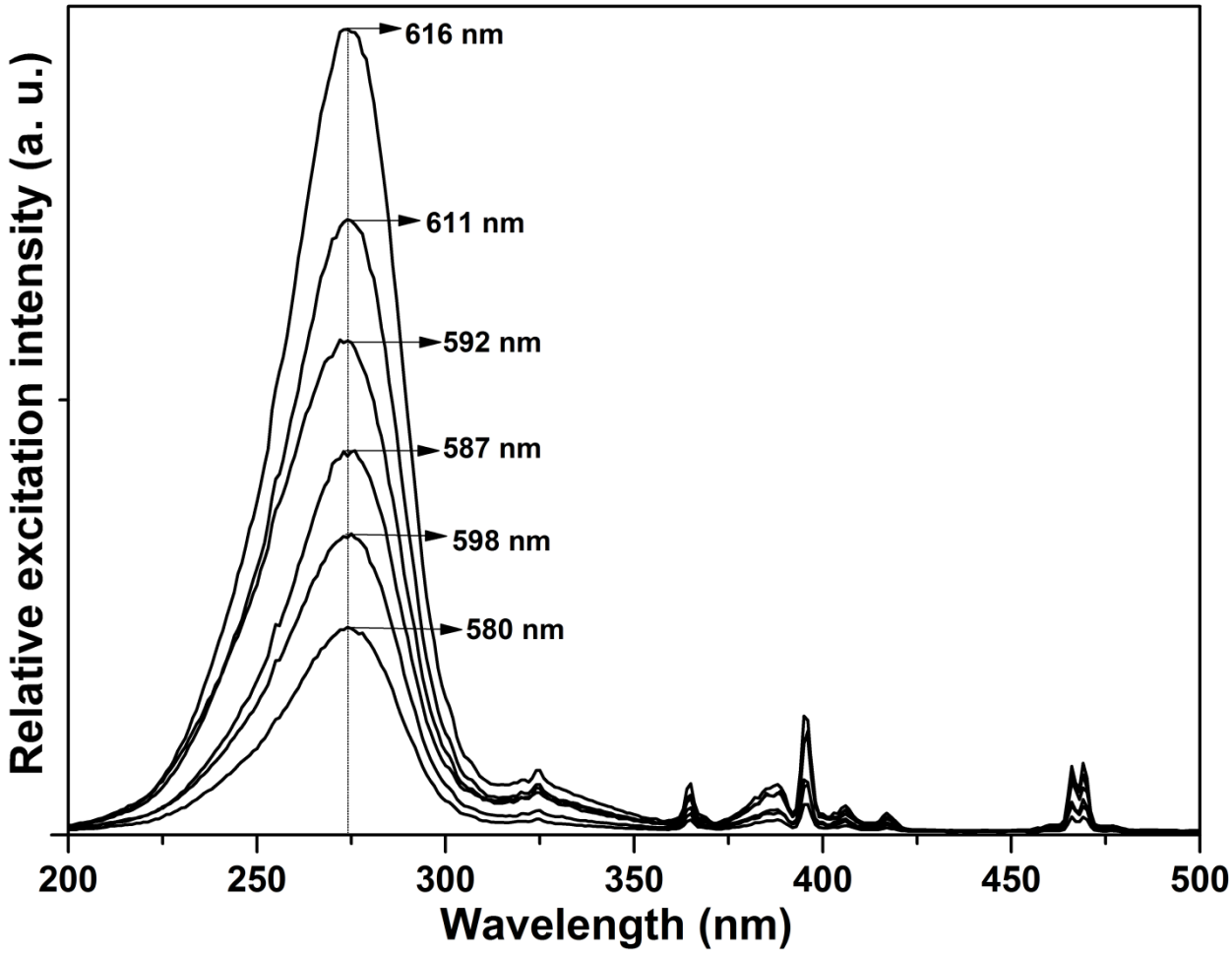

Fig. S3. PLE spectra of 1 mol% Eu^{3+} doped SY phosphor by monitoring at different emission wavelengths

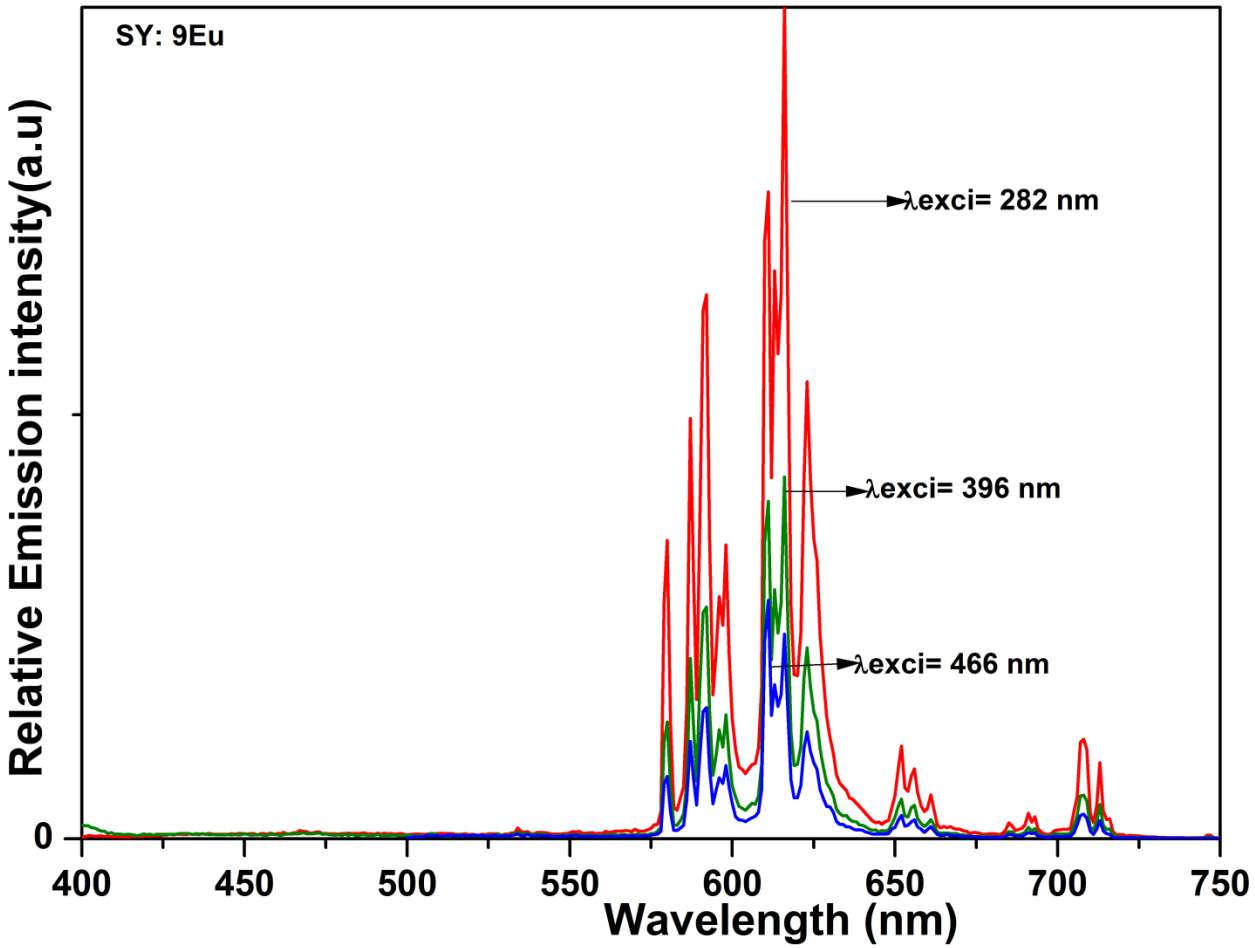

Fig. S4. PL spectra of 9 mol% Eu^{3+} doped SY phosphor by exciting at different wavelengths

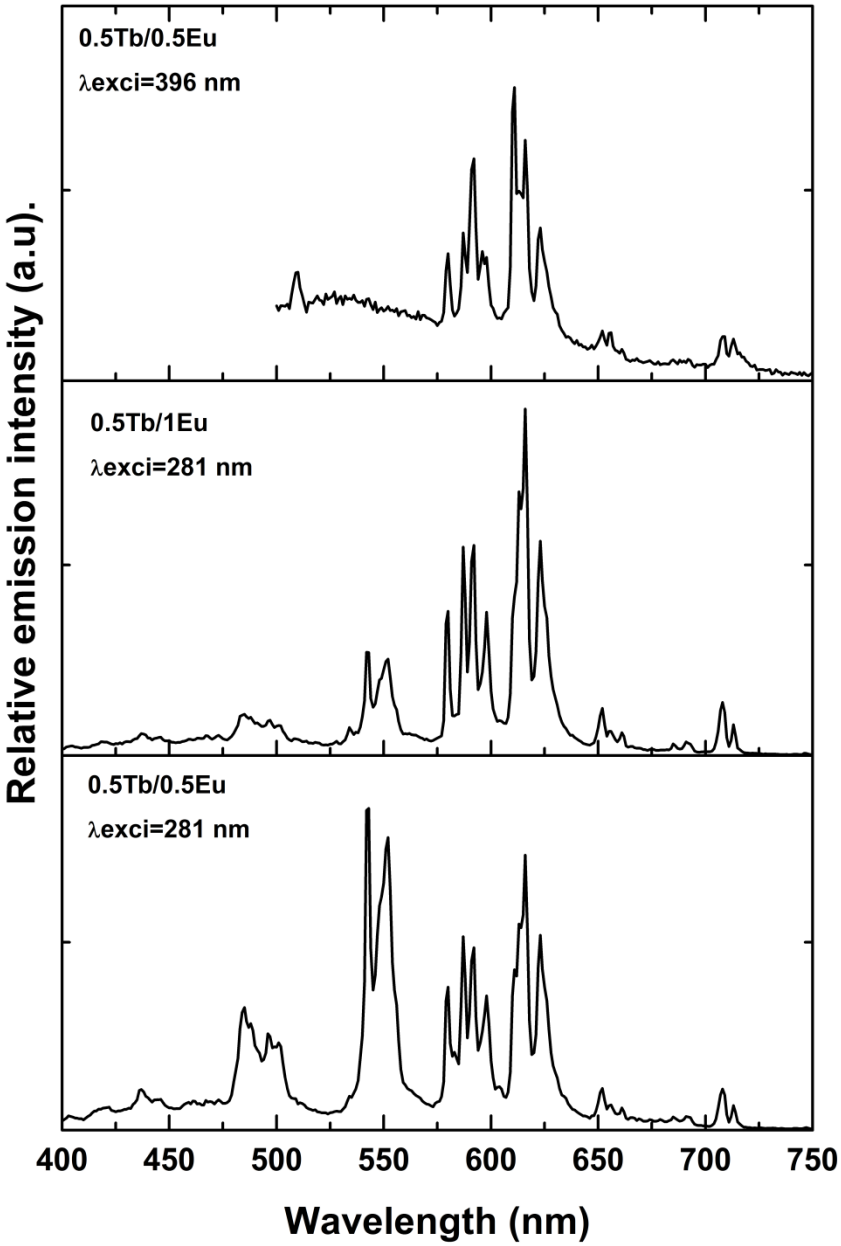

Fig. S5. comparison in PL spectra of 0.5 and 1 mol% Eu co-doped SY: 0.5 Tb^{3+} by exciting with similar wavelengths and PL spectra of 0.5 mol% mol Eu^{3+} co-doped SY: 0.5 Tb3+ phosphor by exciting with 396 nm wavelengths.

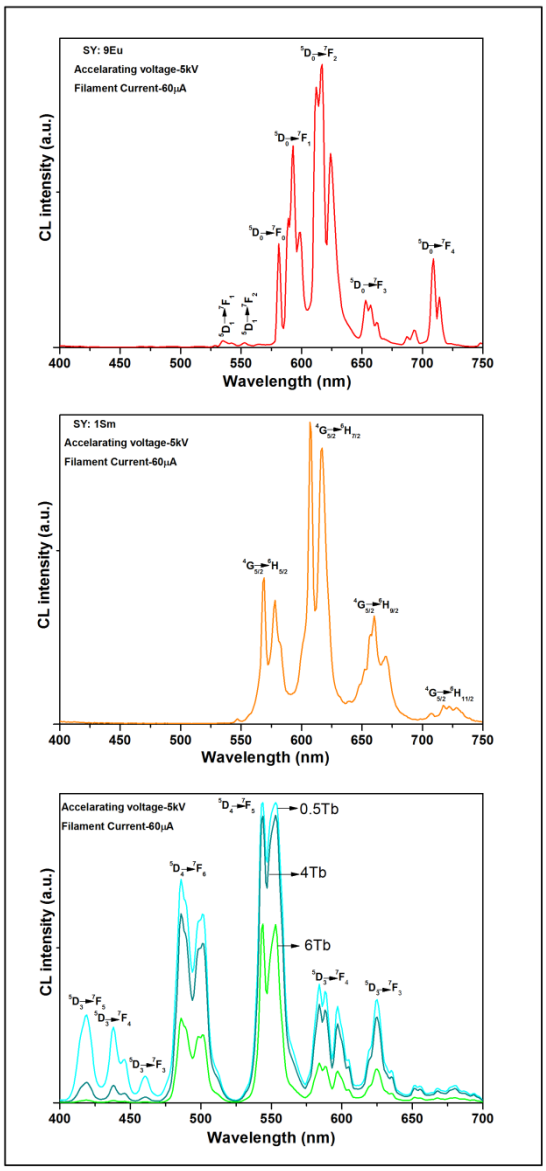

Fig. S6. CL spectra of Eu^{3+}, Sm^{3+} and Tb^{3+} individually activated SY phosphor