

Supporting Information

Correlations between Crystallite/Particle Size and Photoluminescence Properties of Submicron Phosphors

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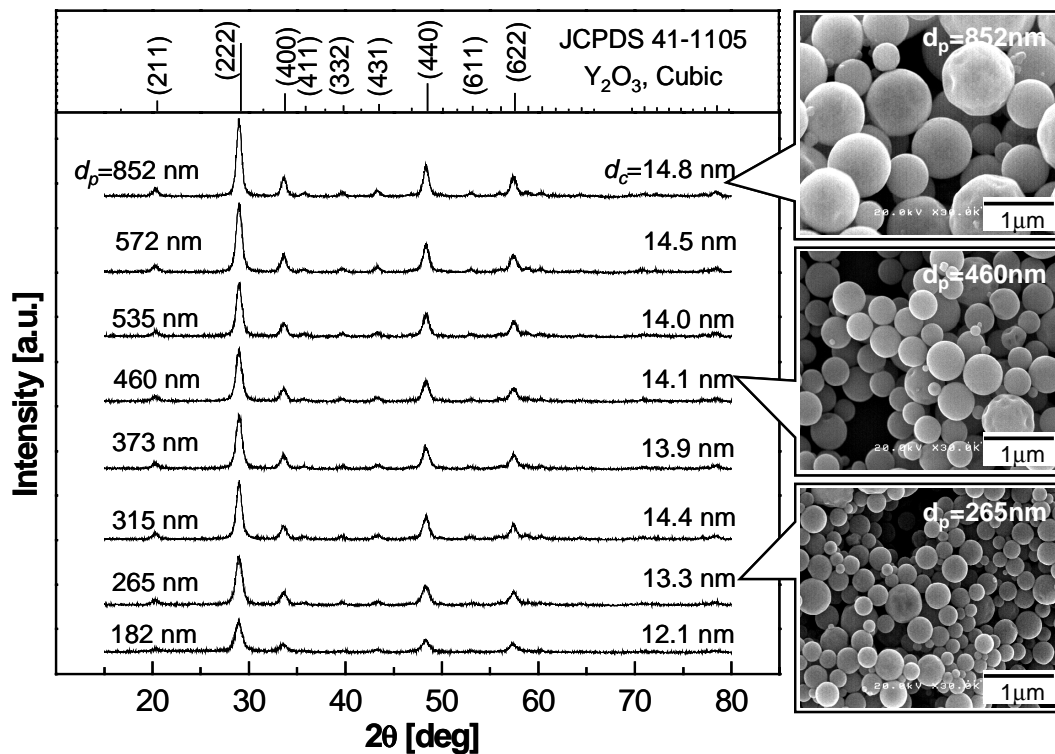


Figure S1. X-ray diffraction (XRD) patterns (left) and field emission scanning electron microscopy (FE-SEM) images (right) of annealed $\text{Y}_2\text{O}_3:\text{Eu}^{3+}$ particles from precursors with various concentrations at 1000 °C

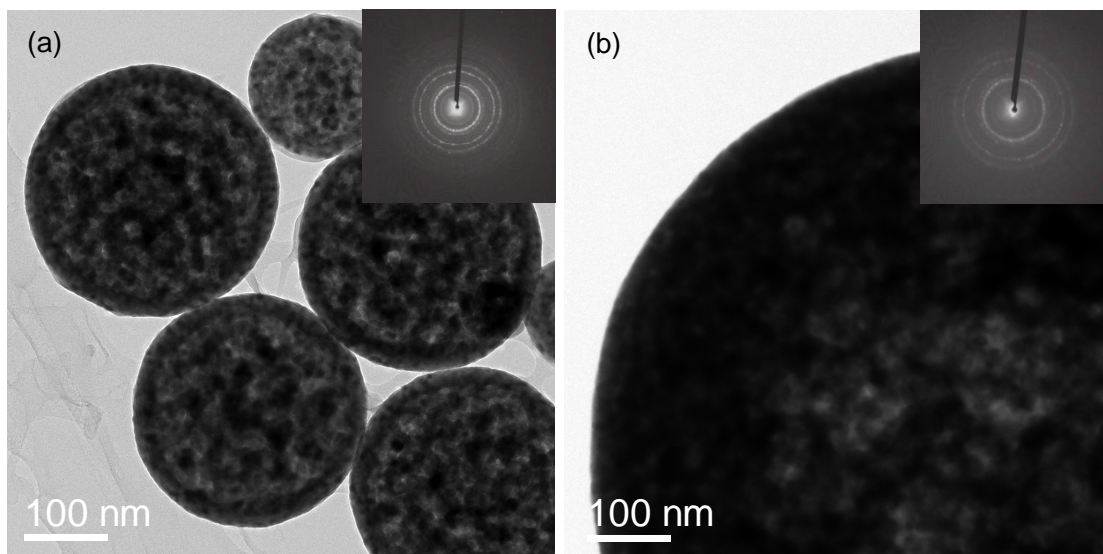
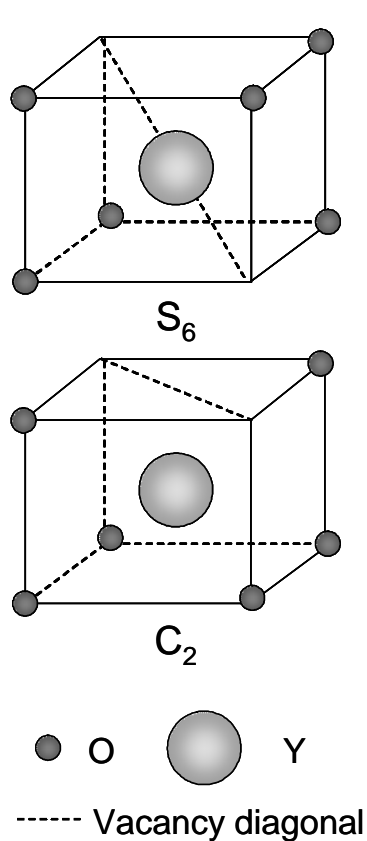
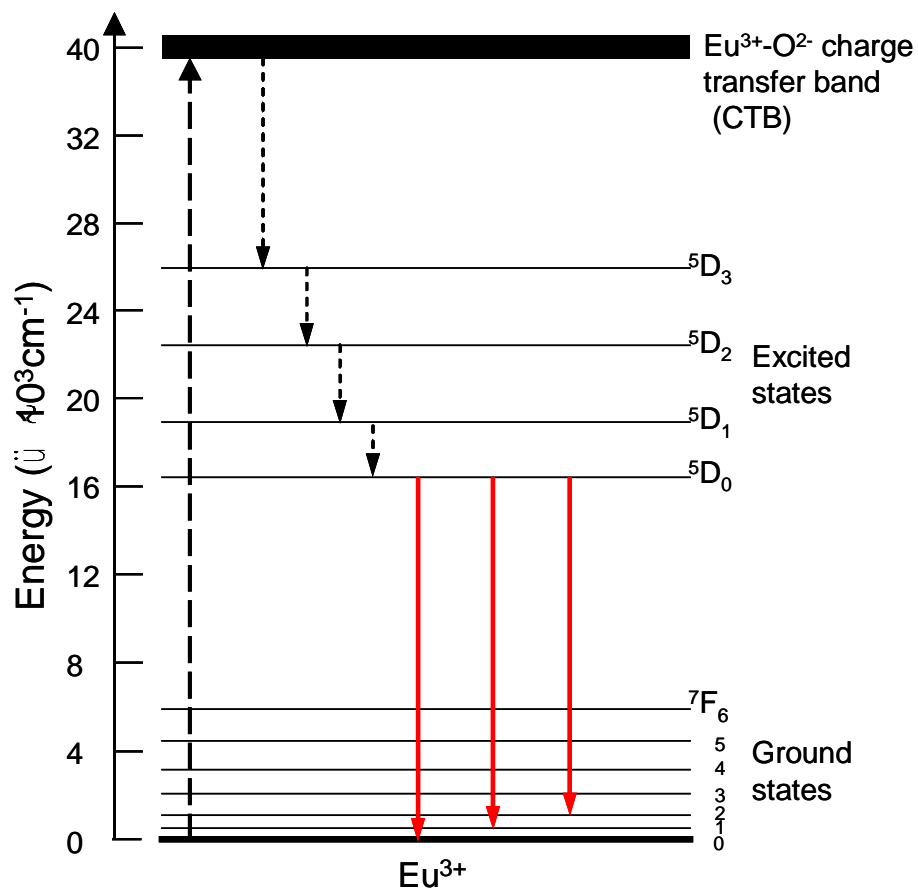


Figure S2. Transmission electron microscopy (TEM) images of two $\text{Y}_2\text{O}_3:\text{Eu}^{3+}$ samples, Y-9 (a) and Y-11 (b), with the particle sizes of 265 nm, and 852 nm; crystallite sizes of about 13.3 nm and 14.8 nm, respectively; the inserts in both images are the selected area electron diffraction (SAED) patterns



(a)



(b)

Figure S3. Schematic diagram of two crystallographic sites of Y^{3+} in $Y_2O_3:Eu^{3+}$: One is the S_6 site with inversion symmetry, and the other is the C_2 site (a); Energy level diagram of the $4f^6$ configuration of the Eu^{3+} ion in the cubic Y_2O_3 lattice (b)

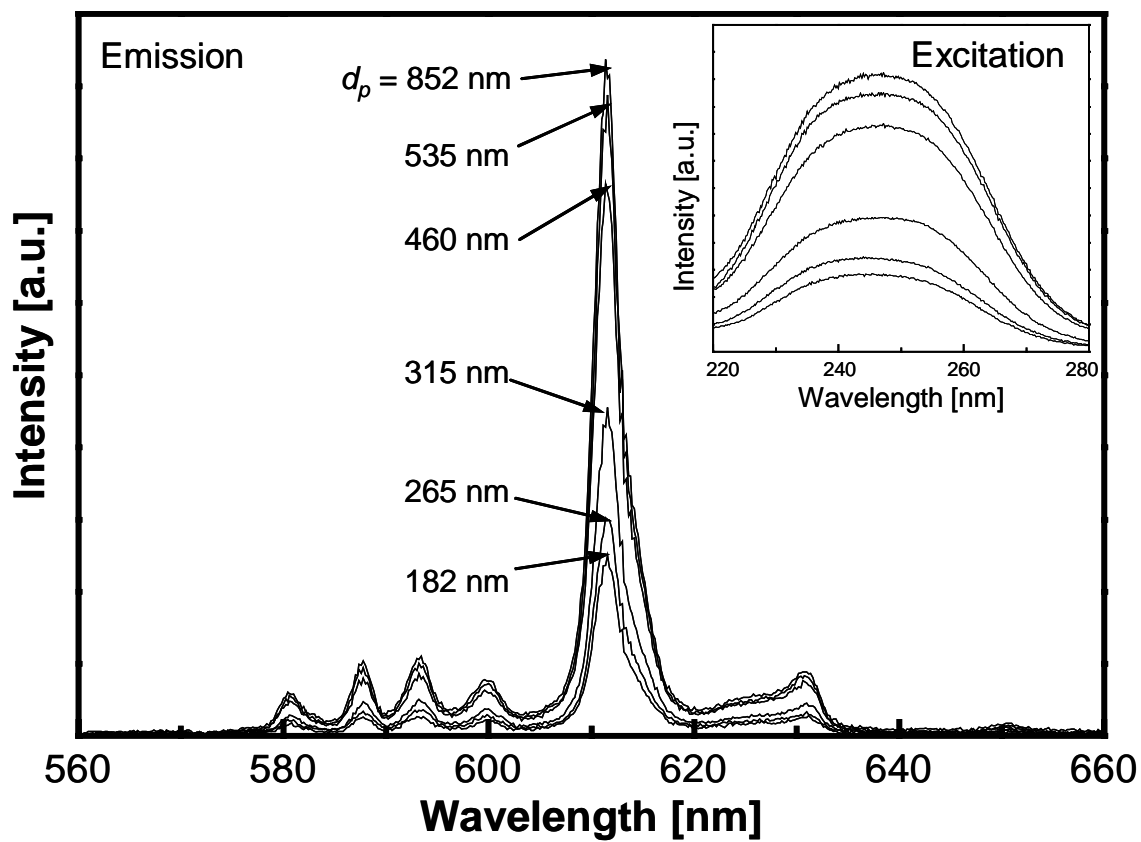


Figure S4. Photoluminescence emission and excitation (insert) spectra of $\text{Y}_2\text{O}_3:\text{Eu}^{3+}$ powders with different particle sizes at a constant crystallite size