Electronic Supplementary Material (ESI) for CrystEngComm.

Supporting Information

Controllable Synthesis and Size-dependent Upconversion Luminescence Properties of $Lu_2O_3:Yb^{3+}/Er^{3+}$ Nanospheres

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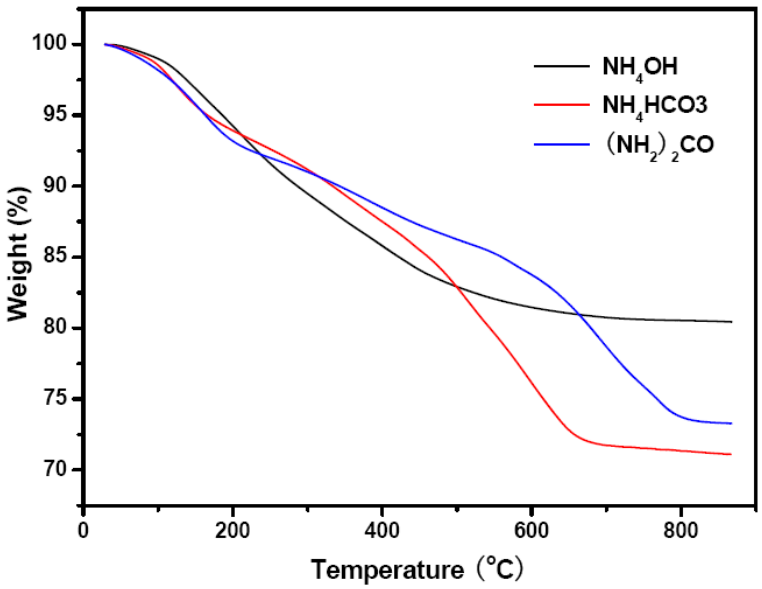

Fig. S1. TGA curves of the precursor samples synthesis with NH_4OH, NH_4HCO_3, and $(NH_2)_2CO$ precipitants.

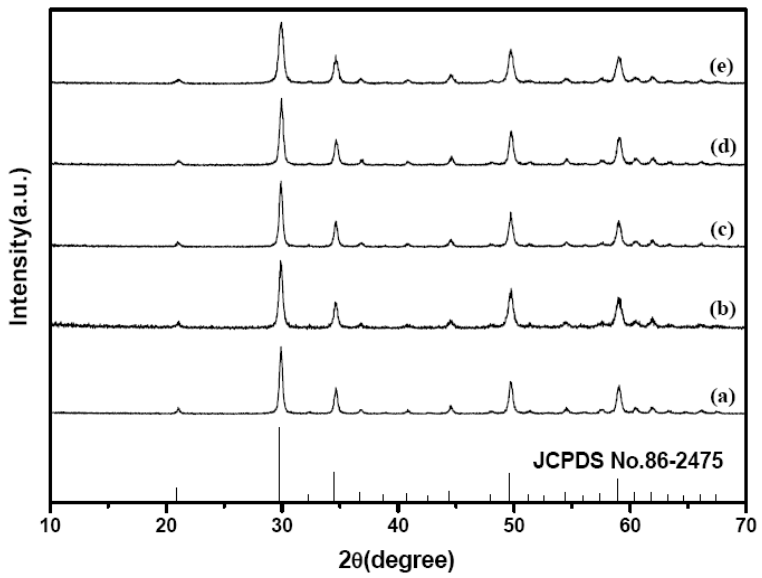

Fig. S2. XRD patterns of Lu_2O_3:Yb^{3+}/Er^{3+} nanocrystals prepared by using different molar ratios of RE^{3+}/$(NH_2)_2CO$. [RE^{3+}]/urea = 2.5×10^{-2} (a); 1.25×10^{-2} (b); 9×10^{-3} (c); 3×10^{-3} (d); 7.5×10^{-4} (e). The standard data for cubic Lu_2O_3 (JCPDS No.86-2475) is also presented in the figure for comparison.

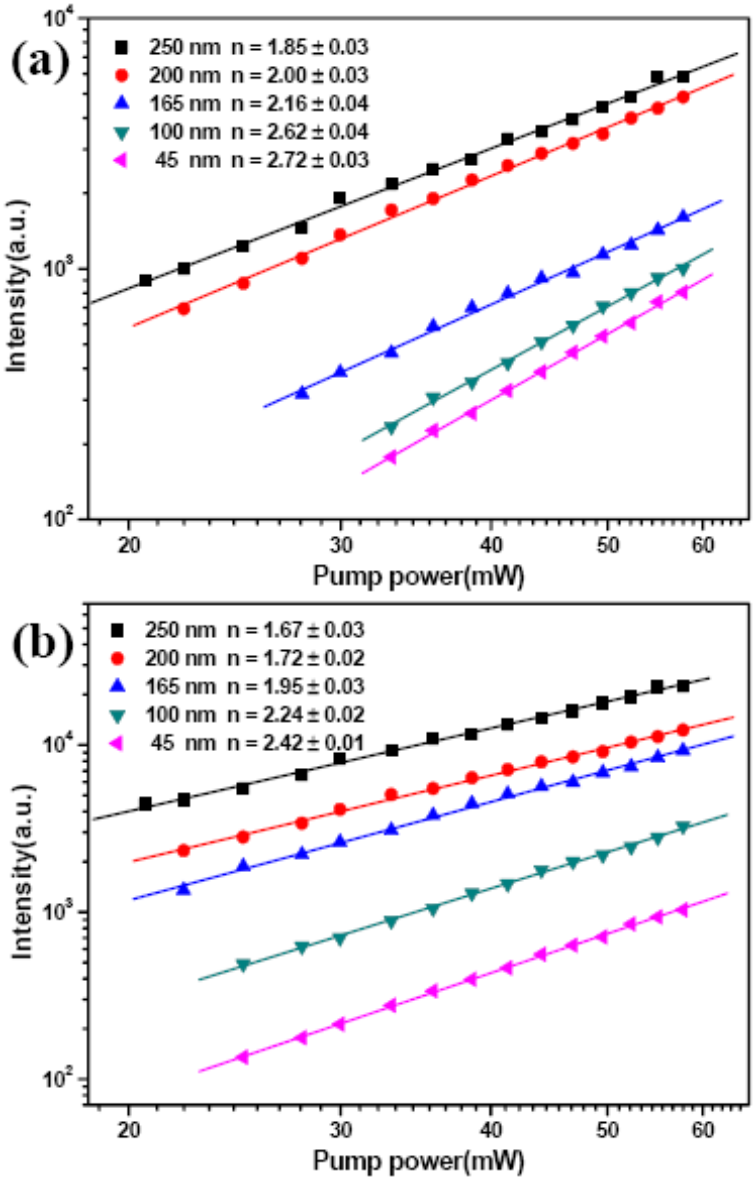

Fig. S3. Power dependence of UCL intensities of Lu_2O_3:Yb^{3+}/Er^{3+} nanocrystals with different sizes. (a) green UCL; (b) red UCL.

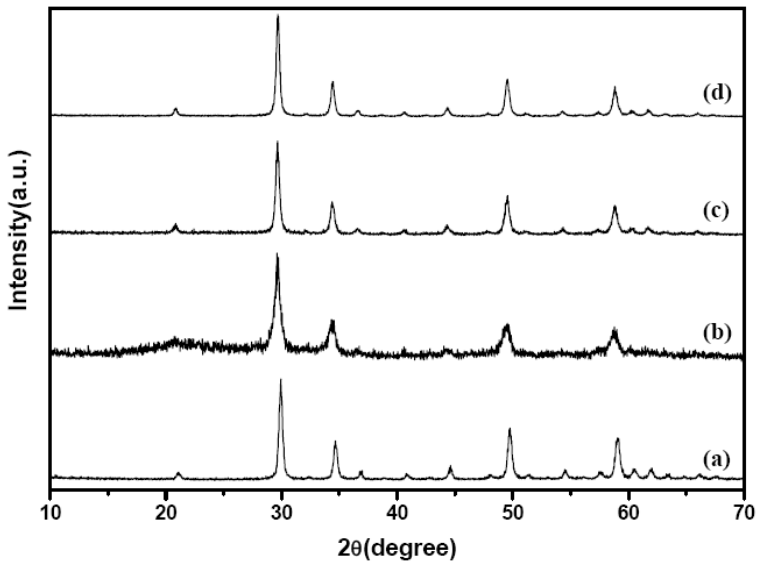

Fig. S4. XRD patterns of Lu_2O_3:Yb^{3+}/Er^{3+} nanospheres with different surface coating. (a) pure Lu_2O_3:Yb^{3+}/Er^{3+} nanocrystals; (b) coating with SiO_2 shell; (c) coating with Lu_2O_3 shell; (d) coating with Lu_2O_3:Yb^{3+} shell.

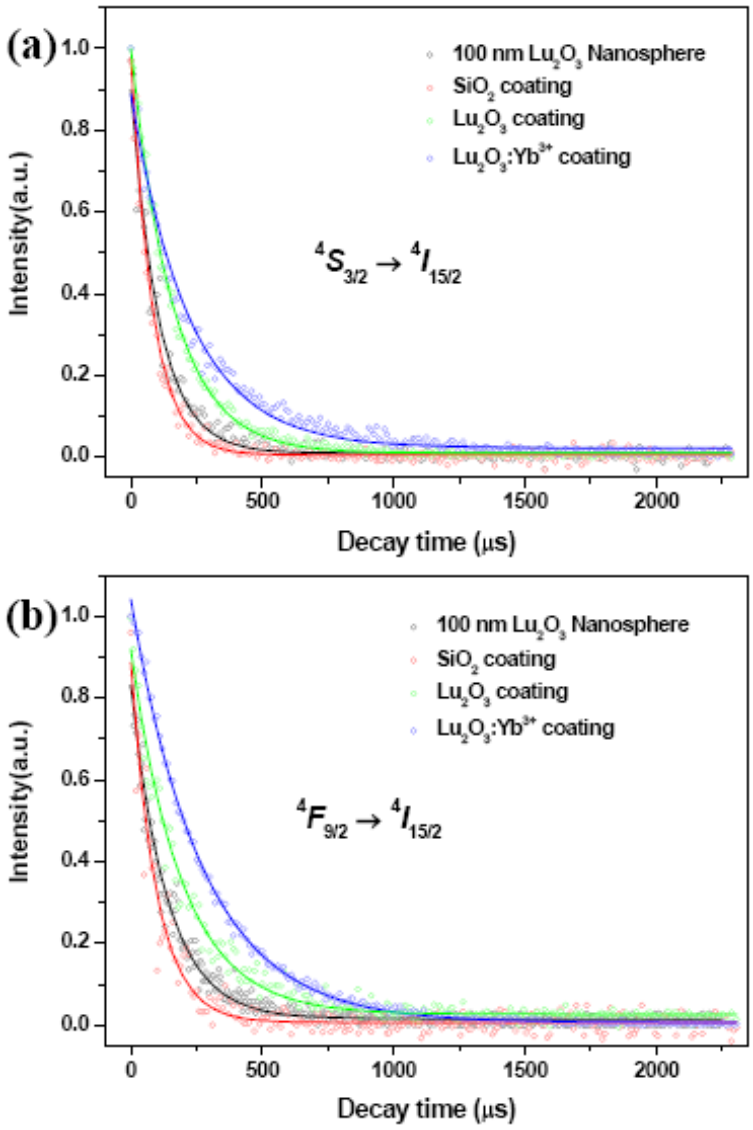

Fig. S5. Luminescence decay curves of Er^{3+} in Lu_2O_3:Yb^{3+}/Er^{3+} nanocrystals with different surface coating. Open circles: experimental data; solid lines: fitting results by $I_{(t)} = I_0\exp(-t/\tau)$. (a) $^4S_{3/2} \rightarrow {}^4I_{15/2}$ transition; (b) $^4F_{9/2} \rightarrow {}^4I_{15/2}$ transition.