Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Large-scale production of spherical $Y_2O_3:Eu^{3+}$ phosphor powders with narrow size distribution using a two-step spray drying method

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This file includes:

• Schematic diagram and digital photo of spray dryer applied in the preparation of precursor powders.

• TG analysis of the $Y_2O_3:Eu^{3+}$ precursor powders directly prepared by first-step spray drying.

• Particle size distributions of the $Y_2O_3:Eu^{3+}$ phosphor powders before and after sintering process.

• N_2 adsorption-desorption isotherms measured at 77 K for the $Y_2O_3:Eu^{3+}$ phosphor powders formed at the various sintering temperatures.

• XRD patterns of the $Y_2O_3:Eu^{3+}$ phosphor powders formed at the various sintering temperatures.

• Excitation and emission spectra of the $Y_2O_3:Eu^{3+}$ phosphor powders prepared by spray drying method and the commercial $Y_2O_3:Eu^{3+}$ product.

• XRD patterns of the (a) first spray dried, and (b) crushed $Y_2O_3:Eu^{3+}$ phosphor powders.

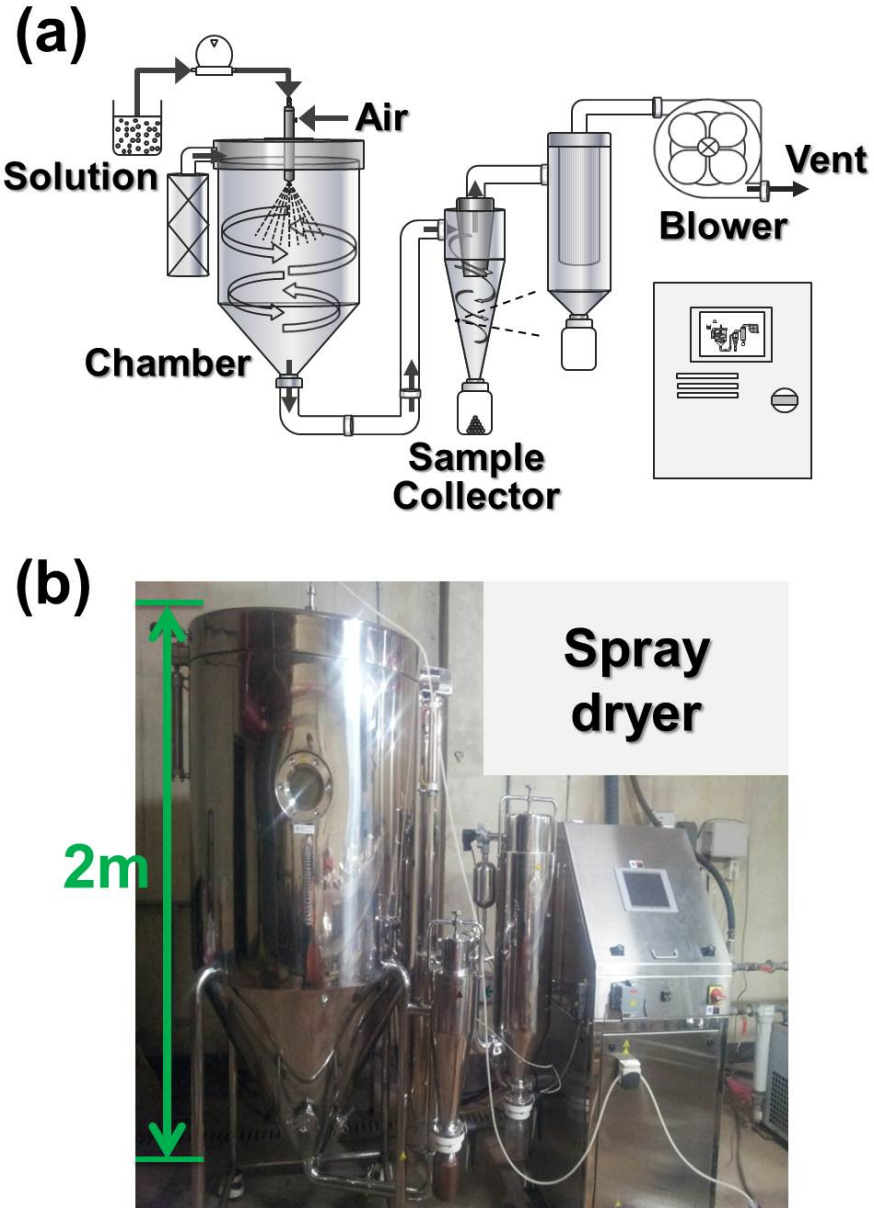

Figure S1. Schematic diagram and digital photo of spray dryer applied in the preparation of precursor powders.

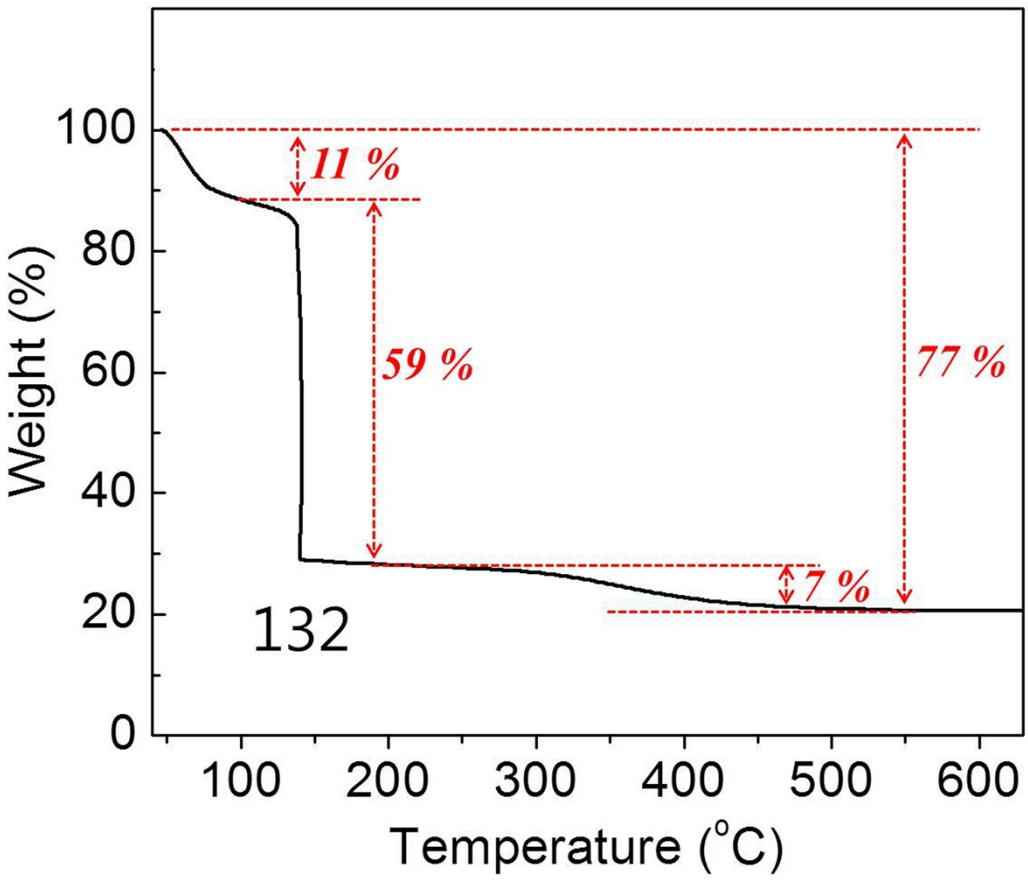

Figure S2. TG analysis of the Y_2O_3:Eu^{3+} precursor powders directly prepared by first-step spray drying.

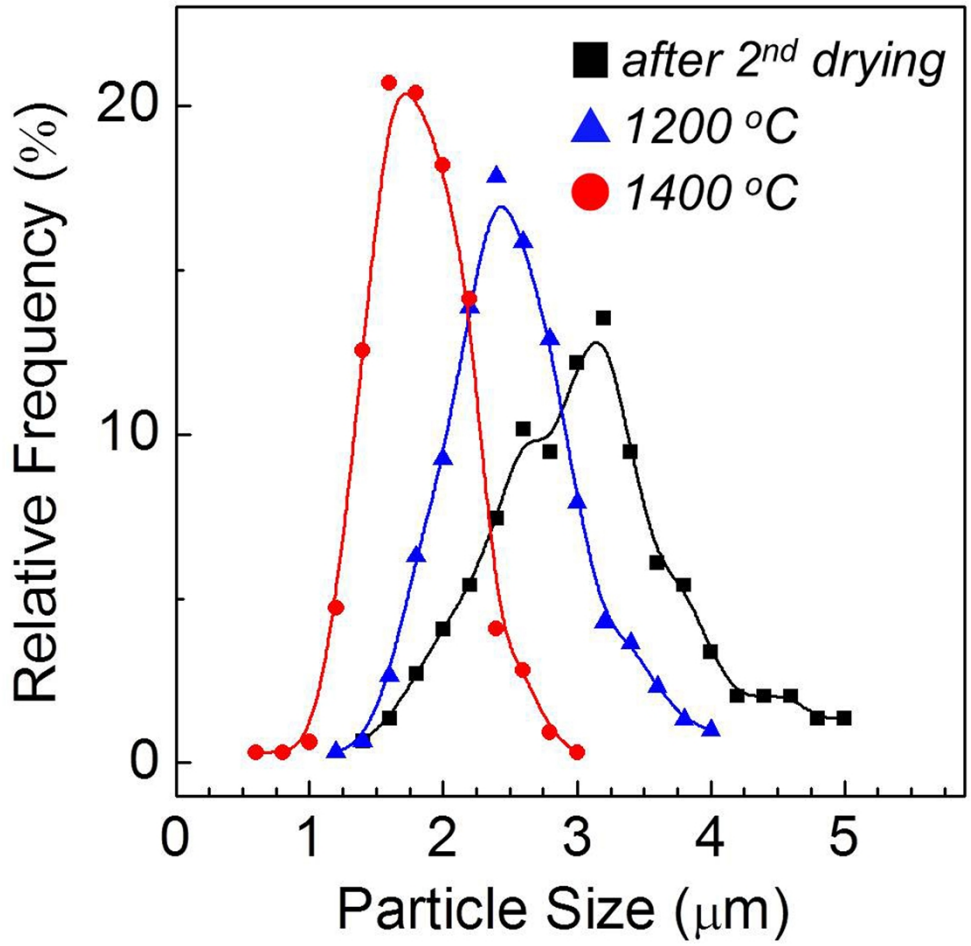

Figure S3. Particle size distributions of the Y_2O_3:Eu^{3+} phosphor powders before and after sintering process.

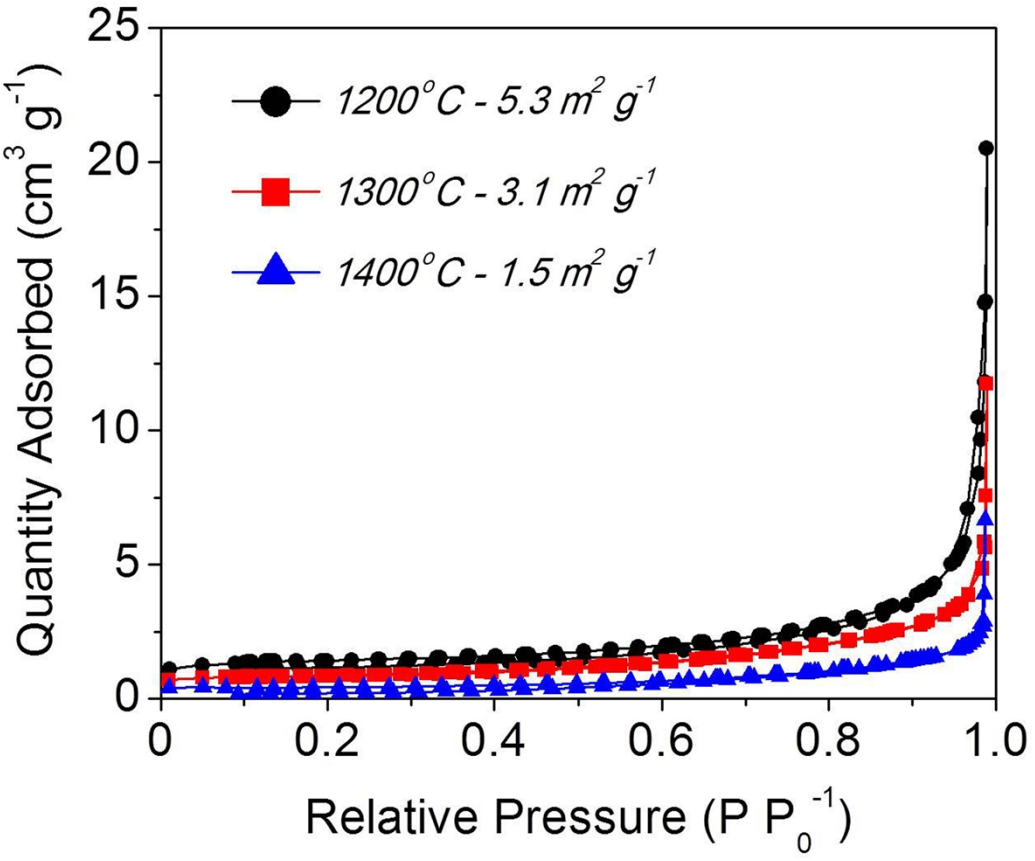

Figure S4. N_2 adsorption-desorption isotherms measured at 77 K for the $Y_2O_3:Eu^{3+}$ phosphor powders formed at the various sintering temperatures.

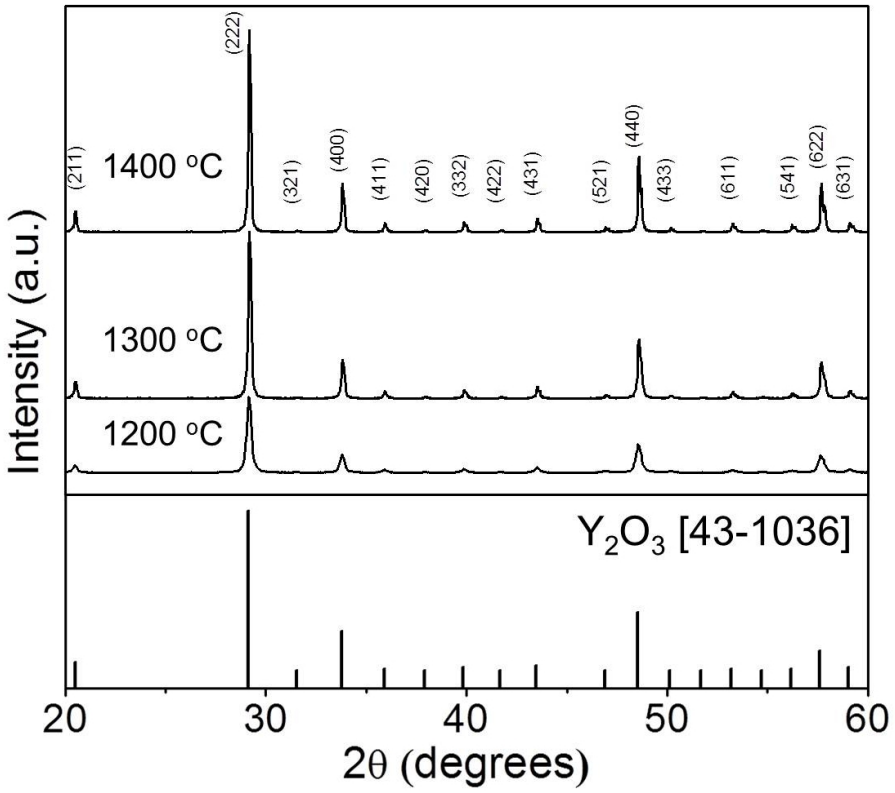

Figure S5. XRD patterns of the Y_2O_3:Eu^{3+} phosphor powders formed at the various sintering temperatures.

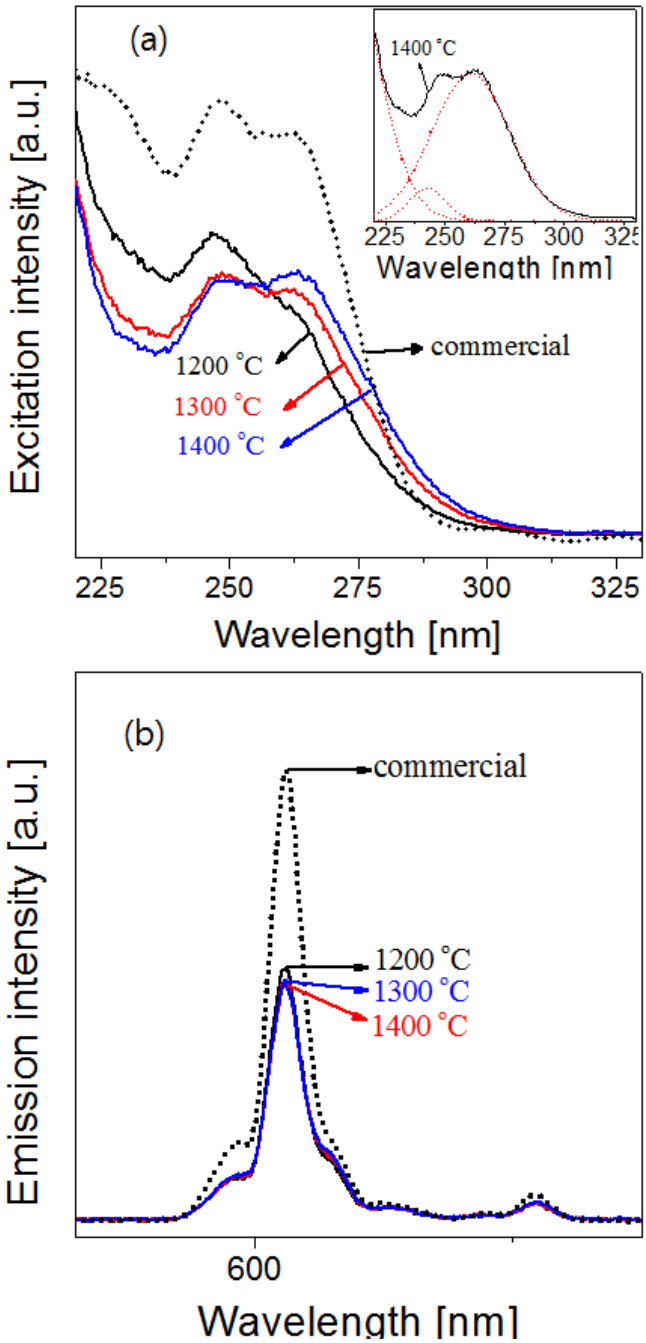

Figure S6. Excitation and emission spectra of the $Y_2O_3:Eu^{3+}$ phosphor powders prepared by spray drying method and the commercial $Y_2O_3:Eu^{3+}$ product.

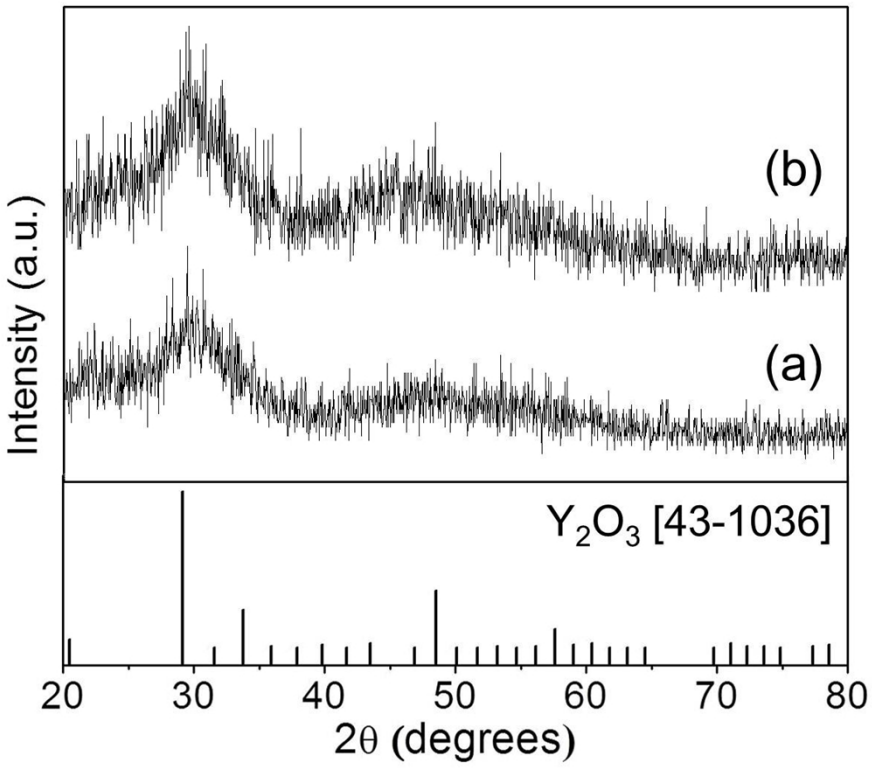

Figure S7. XRD patterns of the (a) first spray dried, and (b) crushed Y_2O_3:Eu^{3+} phosphor powders.