Supporting Information

Novel core-shell structure microspheres based on lanthanide complexes for white light emission and fluorescence sensing

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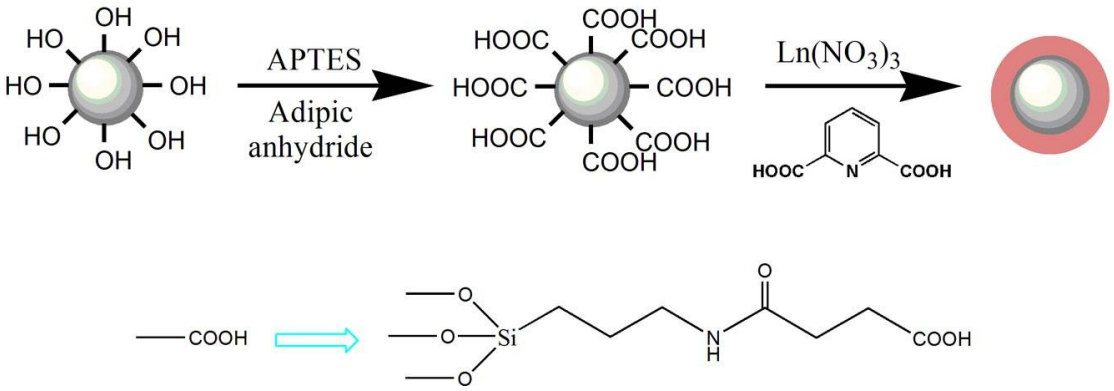
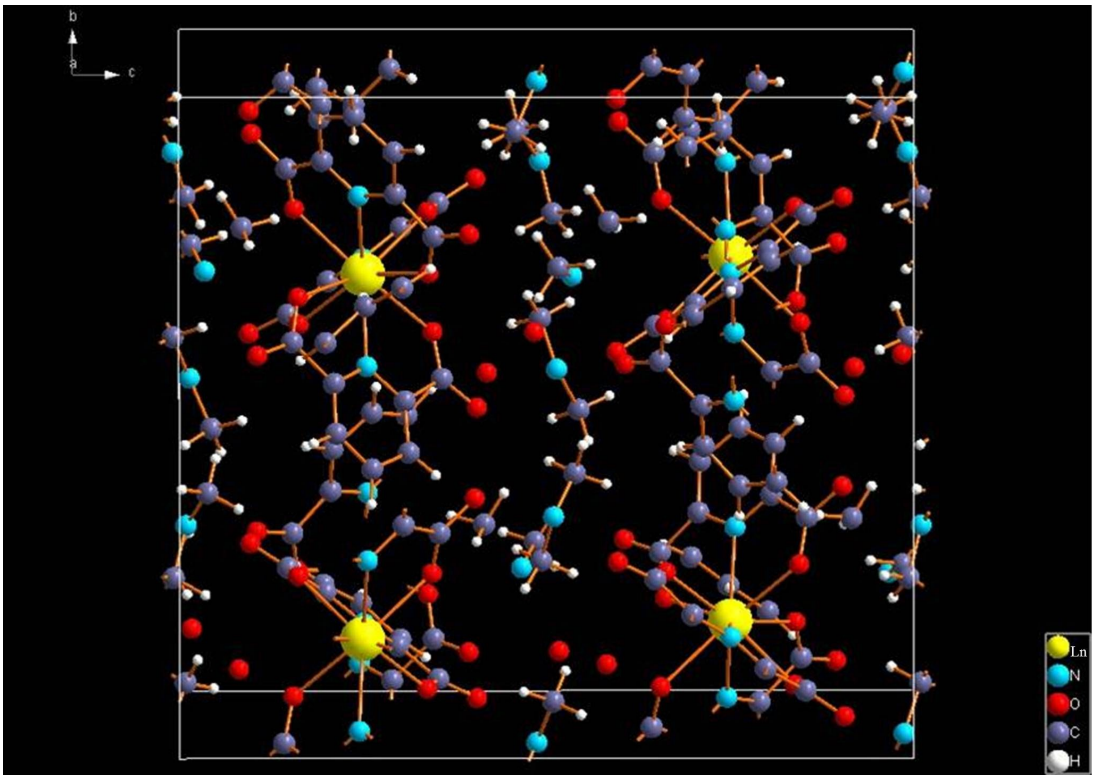


Fig. S1 The synthesis process of SiO_2@Ln-dpa.



Scheme S1. The structure and typical coordination environment of $[H_2NMe_2]_3[Ln(dpa)_3]$.

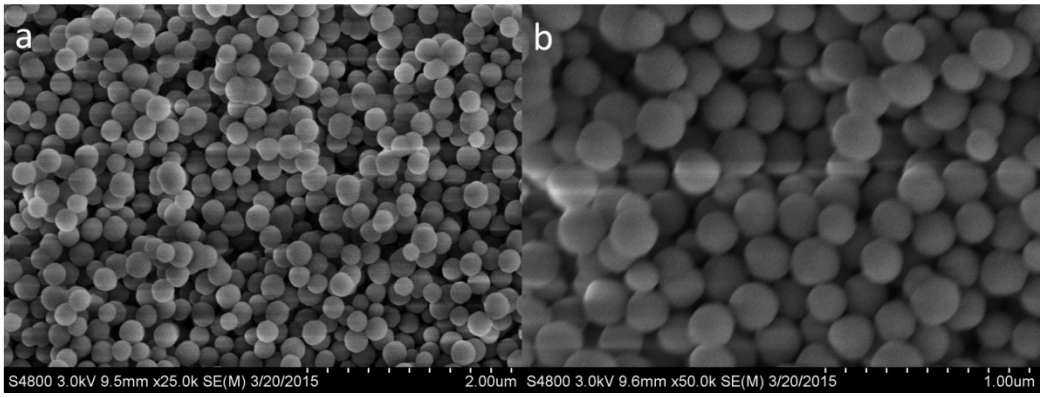


Fig. S2 The selected SEM images of silica microspheres.

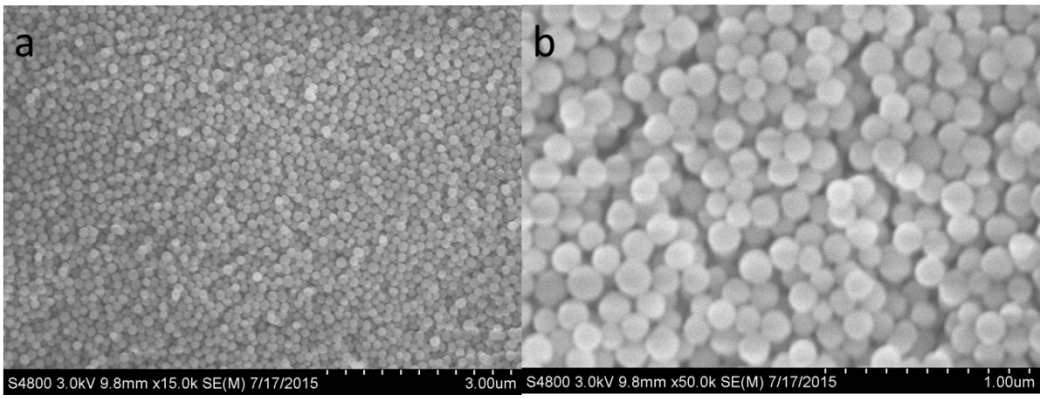


Fig. S3 The selected SEM images of SiO_2@Ln-dpa.

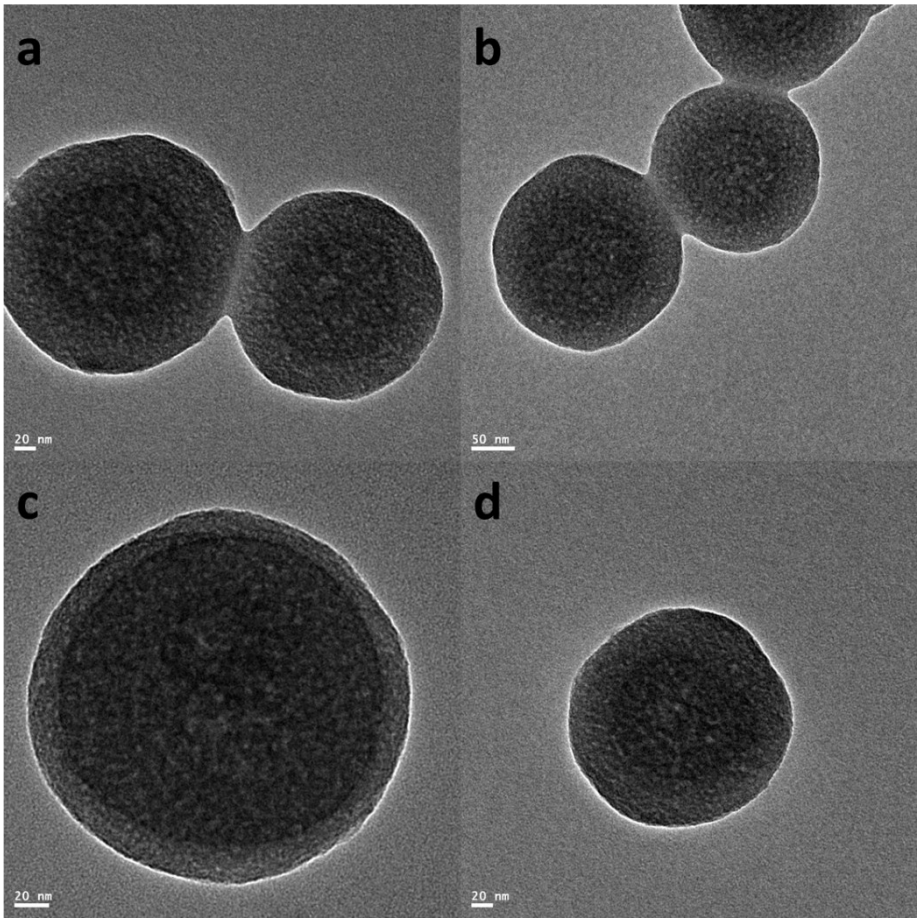


Fig. S4 The selected TEM images of SiO_2@Ln-dpa.

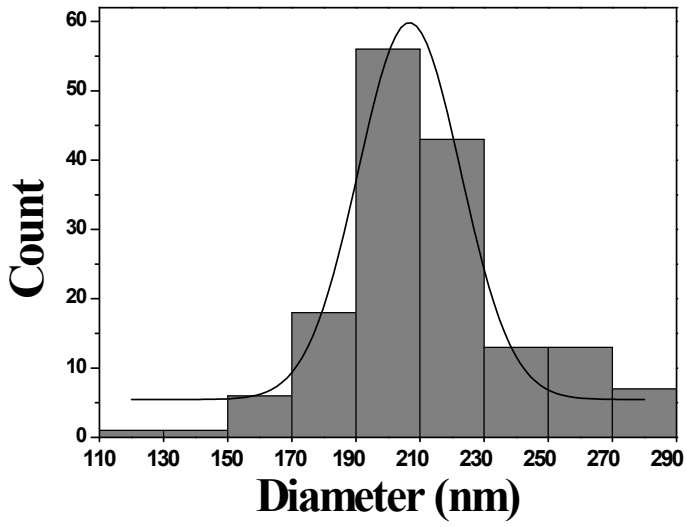


Fig. S5 Particle size distribution of as-synthesized bare silica microspheres.

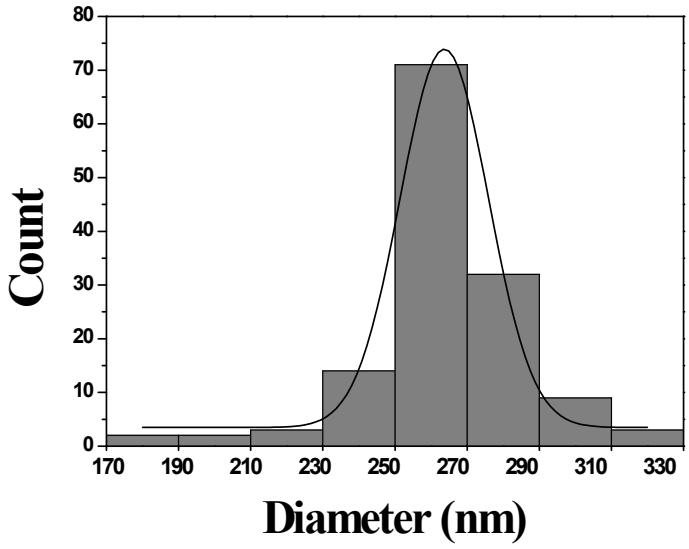


Fig. S6 Particle size distribution of as-synthesized SiO_2@Ln-dpa.

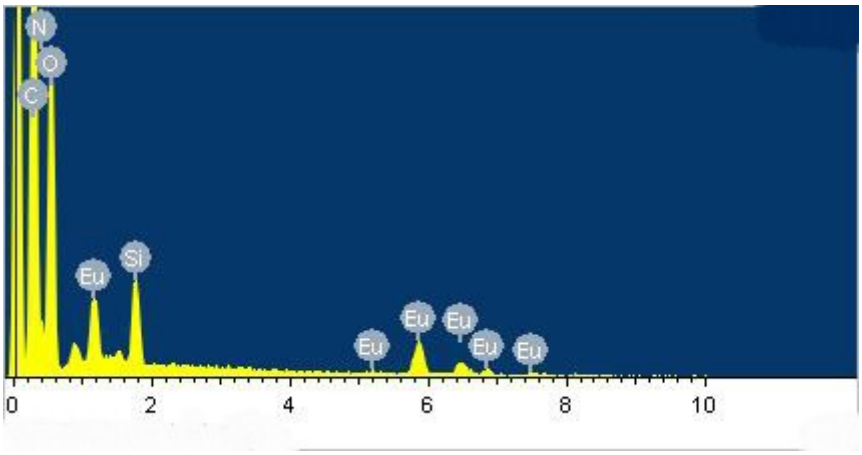


Fig. S7 Energy dispersive analysis by X-rays (EDX) spectroscopy of SiO_2@Eu-dpa.

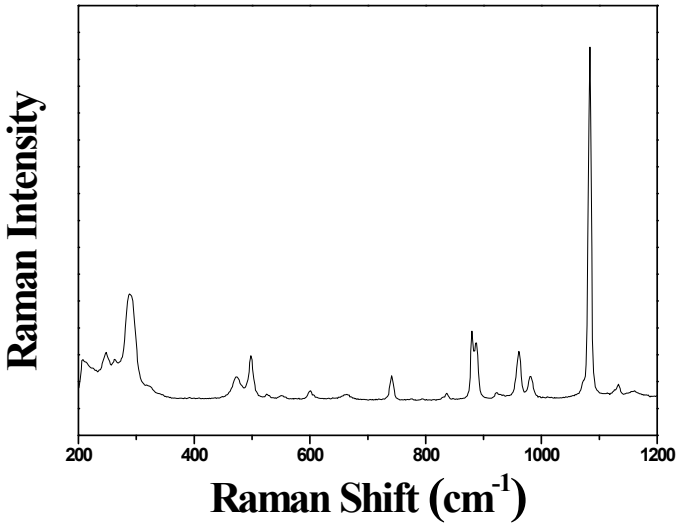


Fig. S8 Raman spectra of SiO_2@Ln-dpa.

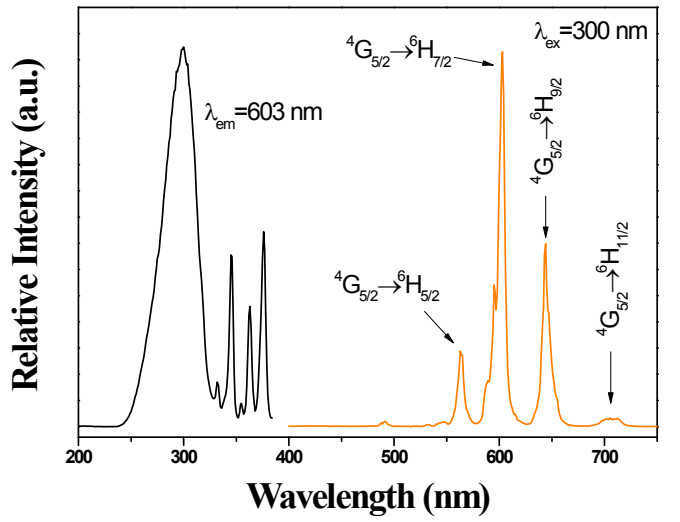


Fig. S9 Excitation spectrum and emission spectrum of SiO_2@Sm-dpa.

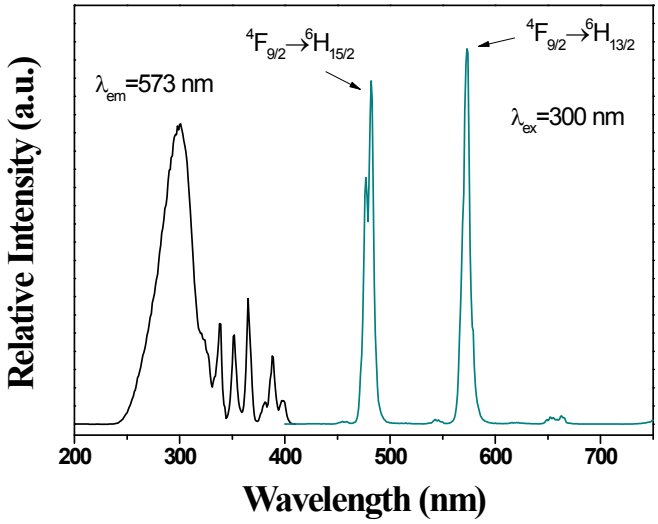


Fig. S10 Excitation spectrum and emission spectrum of SiO_2@Dy-dpa.

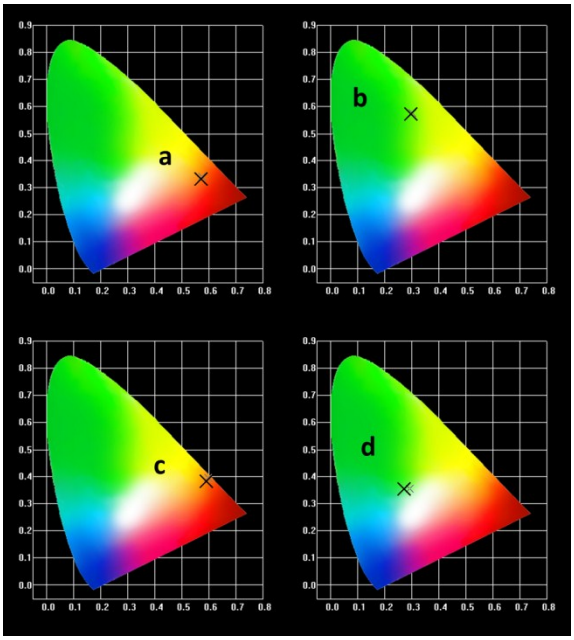


Fig. S11 CIE chromaticity diagram of (a) SiO_2@Eu-dpa; (b) SiO_2@Tb-dpa; (c) SiO_2@Sm-dpa; (d) SiO_2@Dy-dpa.

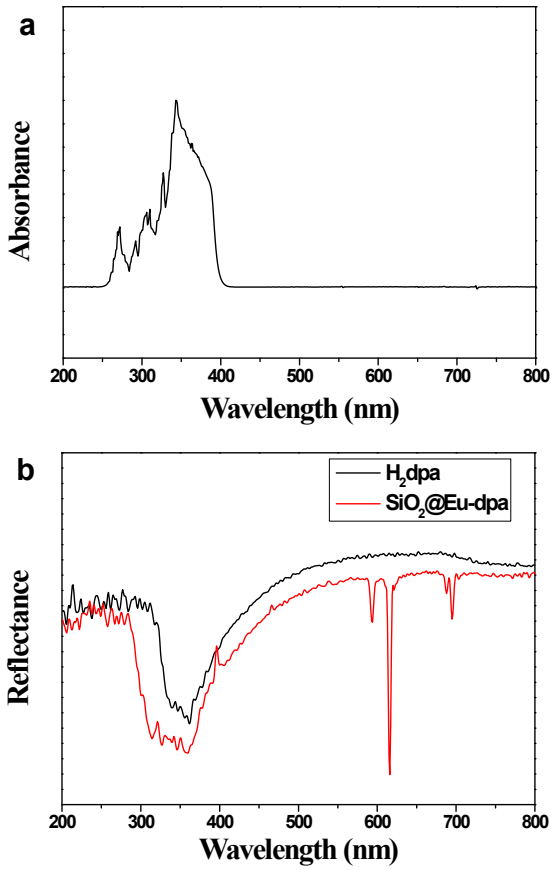


Fig. S12 (a) UV–vis absorption spectroscopy of acetone; (b) ultraviolet diffuse-reflectance spectra of H_2dpa and SiO_2@Eu-dpa.

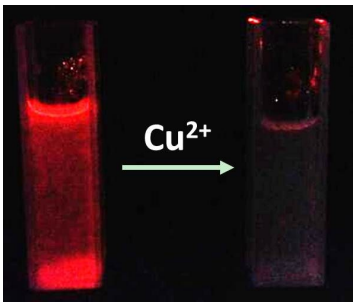


Fig. S13 Photograph of the luminescence change after addition of Cu^{2+} in SiO_2@Eu-dpa suspension under UV light.

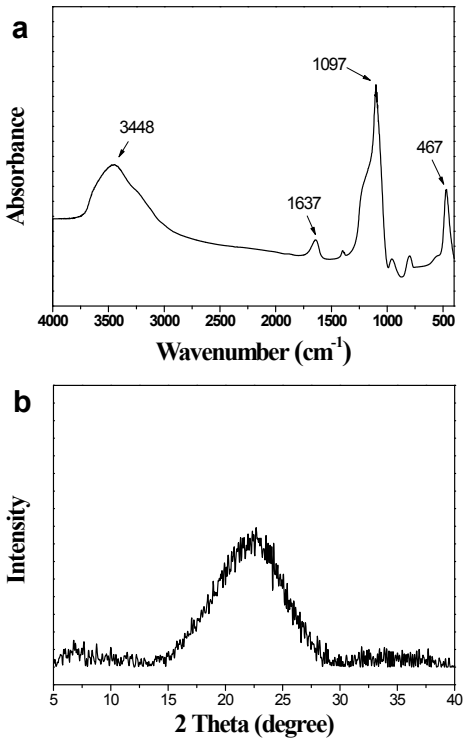


Fig. S14 FTIR spectra (a) and PXRD pattern (b) of the core-shell structure materials after treated with Cu^{2+}.

Table S1. The luminescent data of as-synthesized materials.

	Lifetime	*Total quantum yield*	*Excitation wavelength*
Eu-dpa	1882 μ s	34.1%	293 nm
Tb-dpa	1663 μ s	23.5%	295 nm
SiO_2@Eu-dpa	2398 μ s	45.7%	300 nm
SiO_2@Tb-dpa	2066 μ s	30.4%	300 nm
SiO_2@(Eu:Tb)-dpa	2358 μ s	38.2%	290 nm
SiO_2@(Dy:Eu)-dpa	2066 μ s	28.1%	300 nm