

[Supporting Information]

Synthesis and photoluminescence properties of the novel core-shell-shell SiO₂@CePO₄:Tb@SiO₂ submicro-spheres

Kui-Suo Yang,^a Yi-Lian Li,^a Yang-Yang Ma,^a Li-Na Feng,^a An-Ping Wu,^a Yan Qiao,^a Jin-Rong Bao,^{*a} Wen-Xian Li,^a Xiao-Wei Zhu^b
and Ran-Bo Yu^{*c}

a.School of Chemistry and Chemical Engineering, Inner Mongolia University, Hohhot 010021, China,

b.College of Pharmacology, Inner Mongolia Medical University, Hohhot 010059, China,

c.Department of Physical Chemistry, University of Science and Technology Beijing, Beijing, 100083, China,

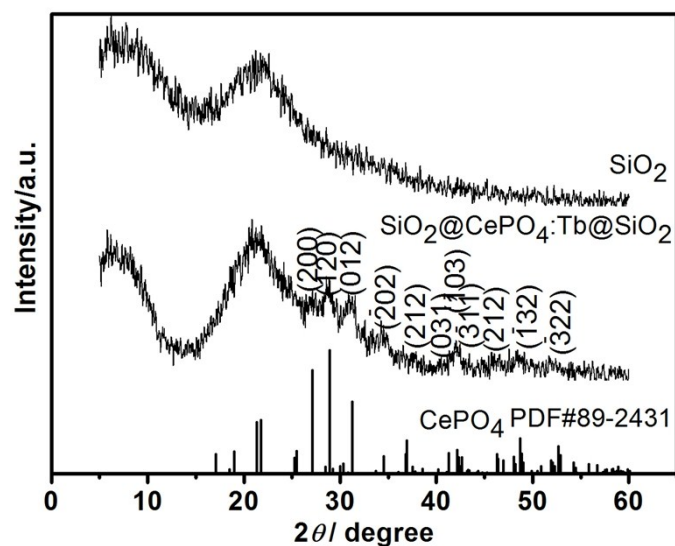


Fig. S1 XRD pattern of SiO₂@CePO₄:Tb@SiO₂

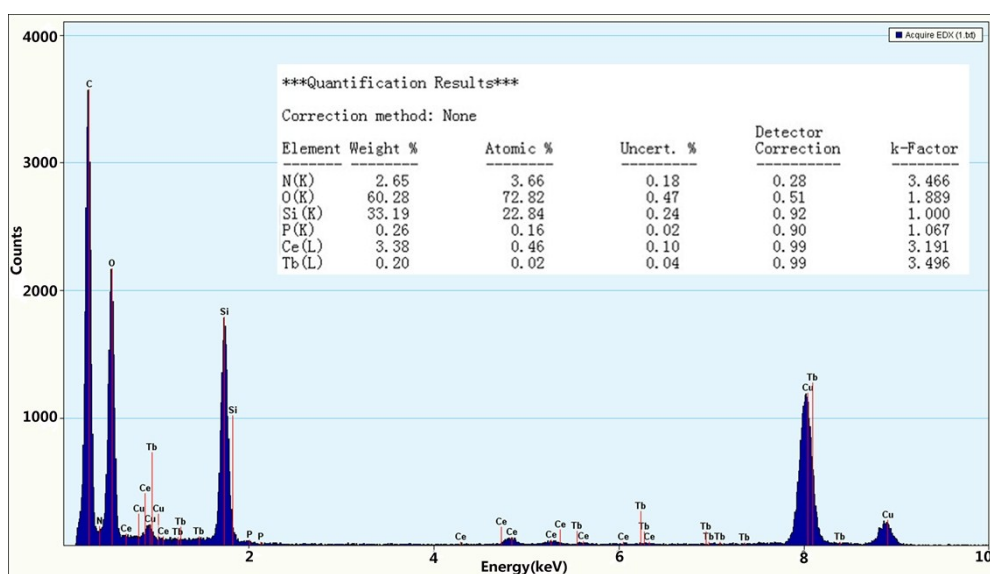


Fig. S2 EDX spectrum of SiO₂@MABA-Si-CePO₄:Tb.

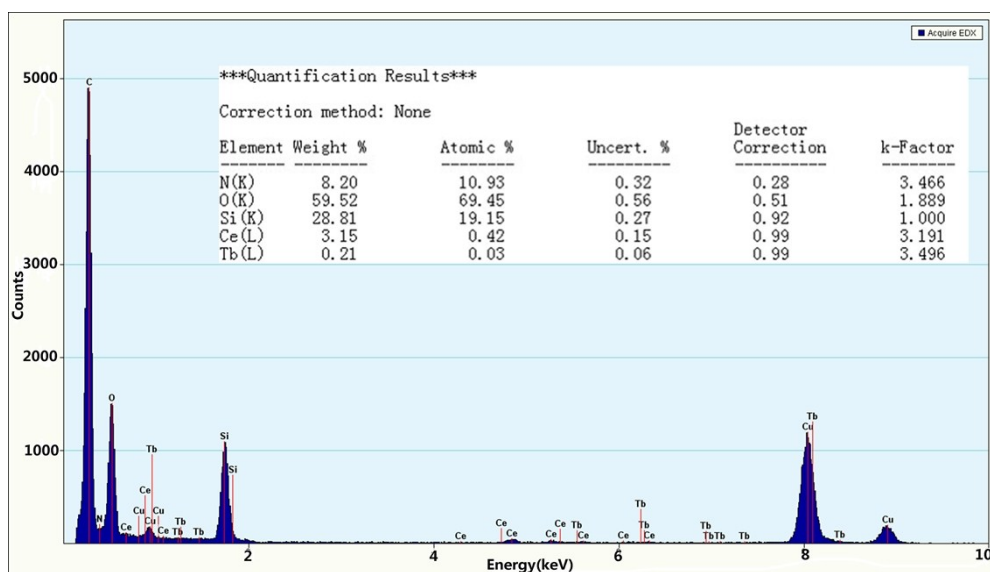


Fig. S3 EDX spectrum of SiO₂@MABA-Si-Ce:Tb.

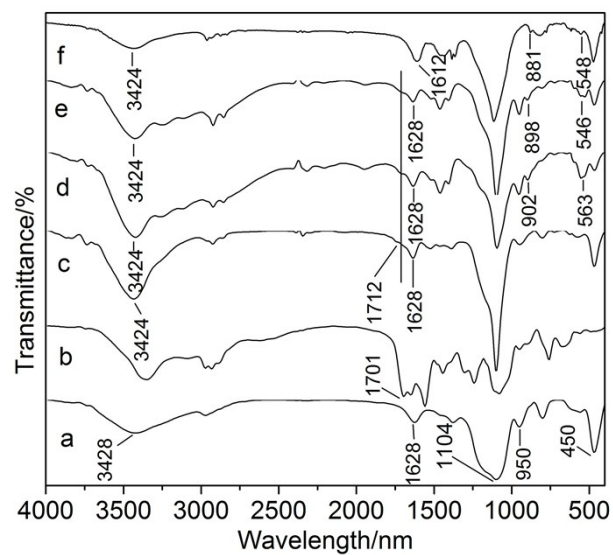


Fig. S4 IR spectra of (a) SiO_2 , (b) MABA-Si, (c) SiO_2 @MABA-Si-Ce:Tb, (d) SiO_2 @MABA-Si-Ce PO_4 :Tb, (e) SiO_2 @MABA-Si-Ce PO_4 :Tb@ SiO_2 , (f) SiO_2 @Ce PO_4 :Tb@ SiO_2 .

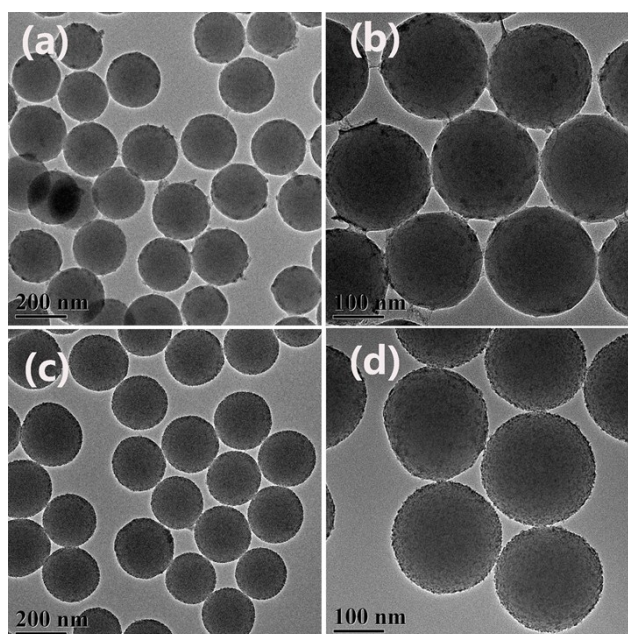


Fig. S5 TEM images of SiO_2 @MABA-Si-Ce PO_4 :Tb prepared with different amount of MABA-Si: (a,b) 2.0 mmol, (c,d) 1.0 mmol.

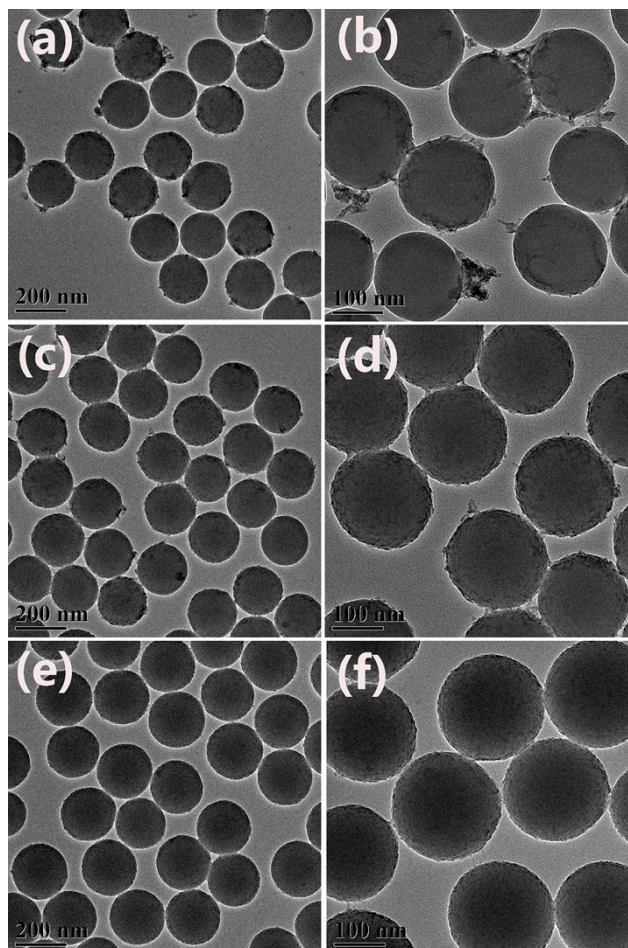


Fig. S6 TEM images of $\text{SiO}_2\text{@MABA-Si-CePO}_4\text{:Tb}$ prepared with different amount of $(\text{NH}_4)_2\text{HPO}_4$, (a,b) 0.25 mmol, (c,d), 0.20 mmol, (e,f) 0.15 mmol.

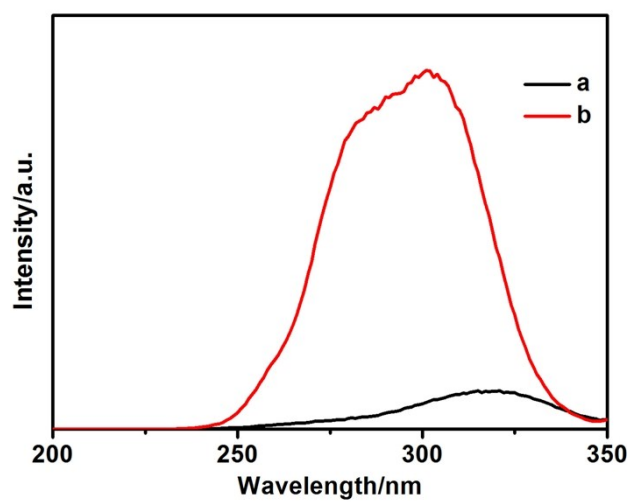


Fig. S7 Excitation spectra of (a) $\text{SiO}_2\text{@MABA-Si-CePO}_4\text{:Tb}$, (b) $\text{SiO}_2\text{@CePO}_4\text{:Tb@SiO}_2$.

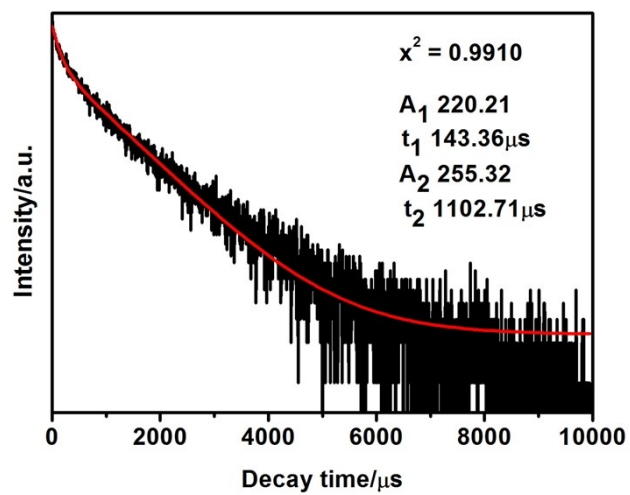


Fig. S8 The photoluminescence decaycurve of $\text{SiO}_2@\text{CePO}_4:\text{Tb}@\text{SiO}_2$.