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SUPPORTING INFORMATION

Surfactant Effect on and Luminescence Tuning of Lanthanide-Doped $ScPO_4 \cdot 2H_2O$ Microparticles

Hongjin Chang[a], Yongsheng Zhu[c], Juan Xie[b], Hongyu Li[a], Botong Liu[a], Shuilin Xu[a], Xiaoji Xie[a,*], Ling Huang[a,*] and Wei Huang[a,b,*]

[a]Key Laboratory of Flexible Electronics (KLOFE) & Institute of Advanced Materials (IAM), Jiangsu National Synergistic Innovation Center for Advanced Materials (SICAM), Nanjing Tech University (NanjingTech), 30 South Puzhu Road, Nanjing 211816, China
[b]Key Laboratory for Organic Electronics and Information Displays & Institute of Advanced Materials (IAM), Jiangsu National Synergistic Innovation Center for Advanced Materials (SICAM), Nanjing University of Posts & Telecommunications, 9 Wenyuan Road, Nanjing 210023, China
[c]Physics and Electronic Engineering College, Nanyang Normal University, Nanyang 473061, China

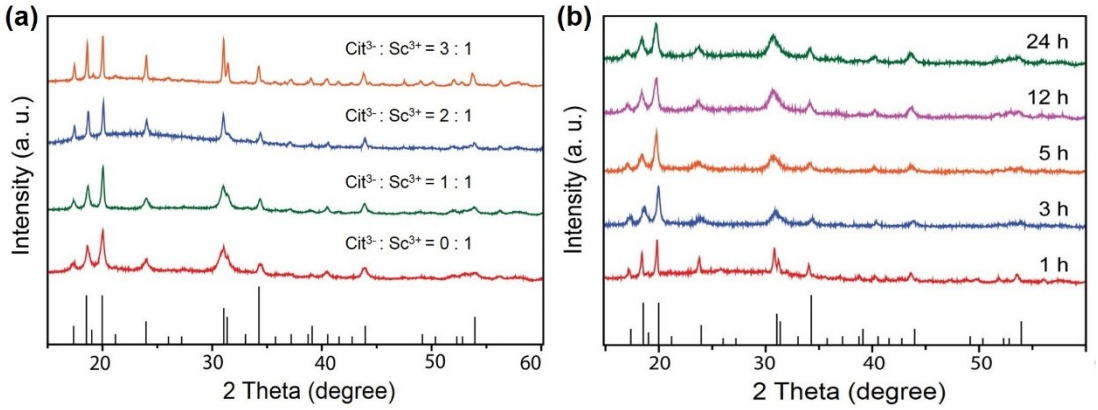

Fig. S1 (a) XRD patterns of $ScPO_4 \cdot 2H_2O$ microparticles obtained at various Cit^{3-}:Sc^{3+} molar ratios; (b) XRD patterns of the $ScPO_4 \cdot 2H_2O$ microparticles synthesized at 180 ^oC for 1 h, 3 h, 5 h, 12 h, and 24 h, respectively. The diffraction patterns at the bottom is the literature reference of monoclinic $ScPO_4 \cdot 2H_2O$ crystal (Joint Committee on Powder Diffraction Standards file number 38-0431).

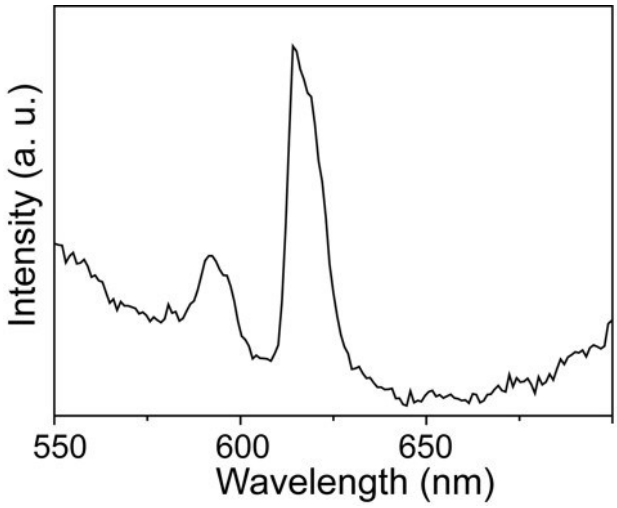

Fig. S2 Room temperature luminescence emission of $ScPO_4 \cdot 2H_2O$:Ce,Eu(4%,12%) microspheres under 260 nm excitation.

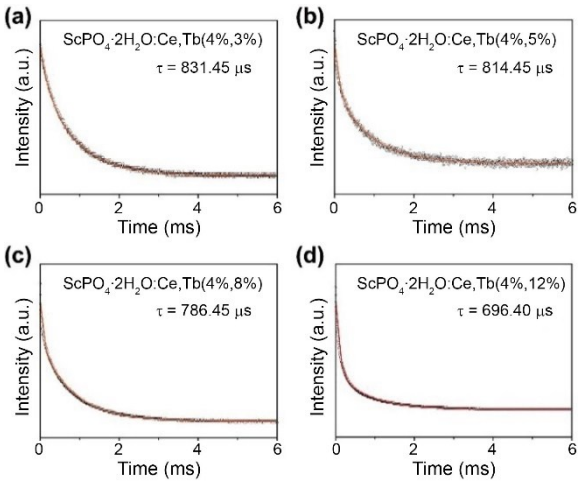

Fig. S3 Decay curves of 550 nm emission of $ScPO_4 \cdot 2H_2O$:4%Ce, (x%)Tb microparticles at x% values of: (a) 3%, (b) 5%, (c) 8%, and (d) 12%.

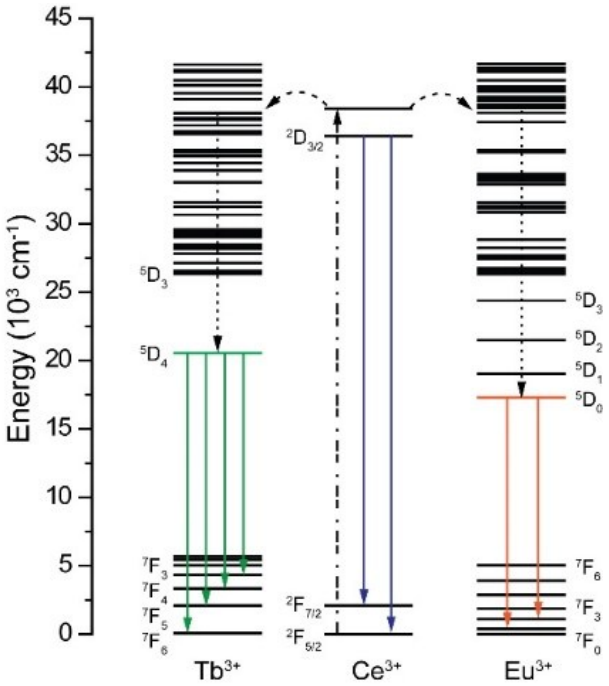

Fig. S4 Proposed energy transfer mechanism of $ScPO_4 \cdot 2H_2O$ microparticles co-doped with Ce^{3+},Tb^{3+} or Ce^{3+},Eu^{3+} under UV excitation. The dashed-dotted, dashed, dotted, and full arrows represent photon excitation, energy transfer, relaxation and emission process, respectively.

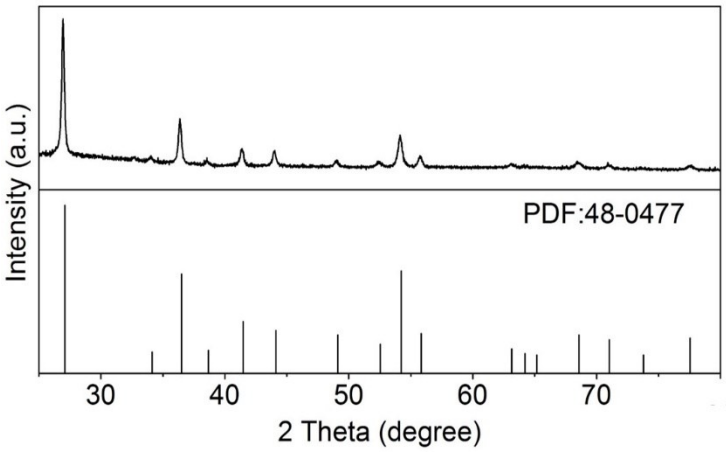

Fig. S5 XRD patterns of the $ScPO_4$ microspheres after annealing at 800 °C under N_2 atmospheres.

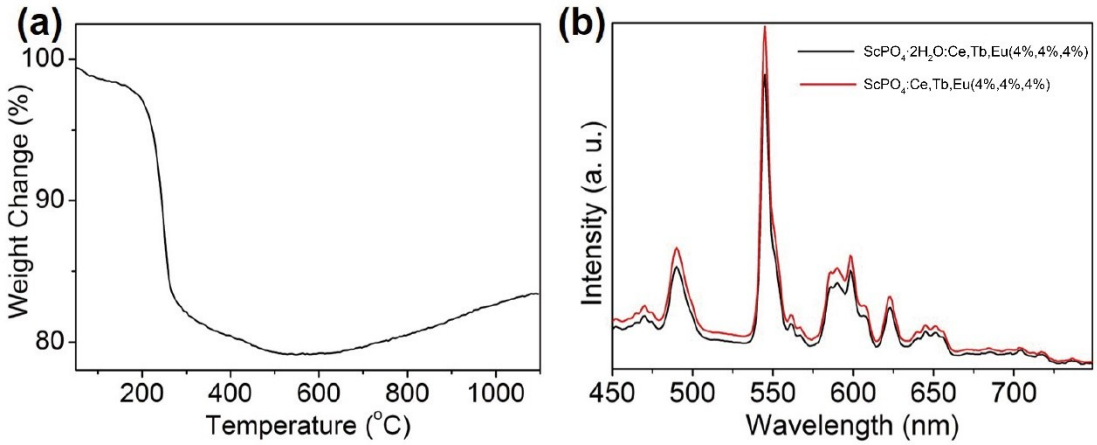

Fig. S6 (a) Thermogravimetric analysis of the $ScPO_4 \cdot 2H_2O$:Ce,Tb,Eu(4%,4%,4%) microspheres under N_2 atmosphere. (b) the corresponding room temperature emission (under 260 nm excitation) of the $ScPO_4$:Ce,Tb,Eu(4%,4%,4%) microspheres, after annealing.

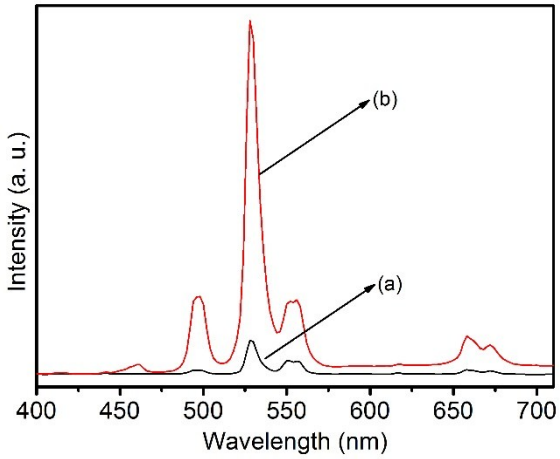

Fig. S7 Upconversion emission of (a) $ScPO_4 \cdot 2H_2O$:Yb/Er and (b) $ScPO_4$:Yb/Er microparticles, excited by 980 nm laser.