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Electronic Supporting Information

Facile Microwave Synthesis of $ScP0_4 \cdot 2H_2O$ Flowerlike Superstructures: Morphology-Control, Electronic Structure and Multicolor Tunable Luminescent Properties

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Table S1 EDS results of the typical product.

Element	Weight%	Atomic%
O K	61.94	79.31
P K	16.29	10.77
Sc K	21.77	9.92
Totals	100.00	

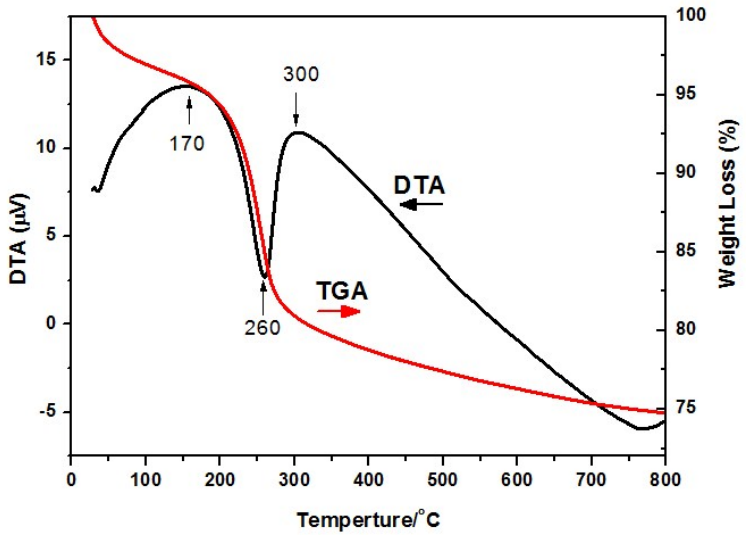

Fig. S1 Thermal analysis (DTA/TGA) of the typical sample.

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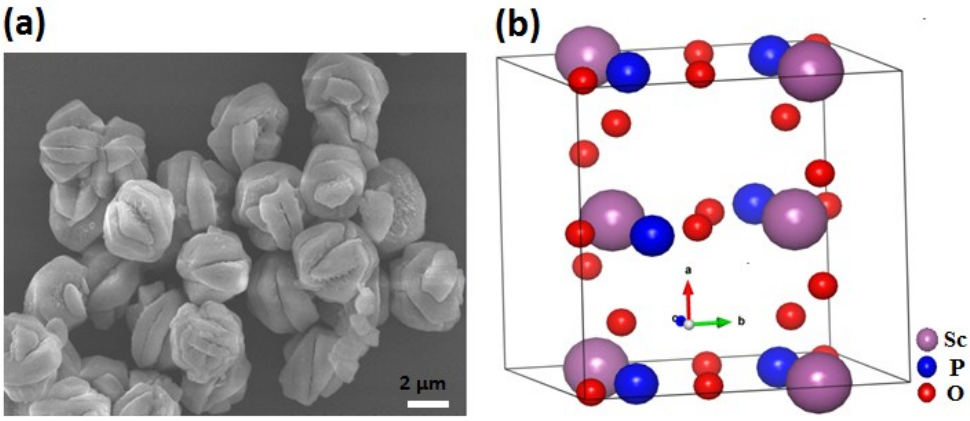

Fig. S2: (a)SEM image of the typical product after calcination (800°C in N_2 atmosphere, 4 hours), and(b) The crystal structure of tetragonal ScPO4.

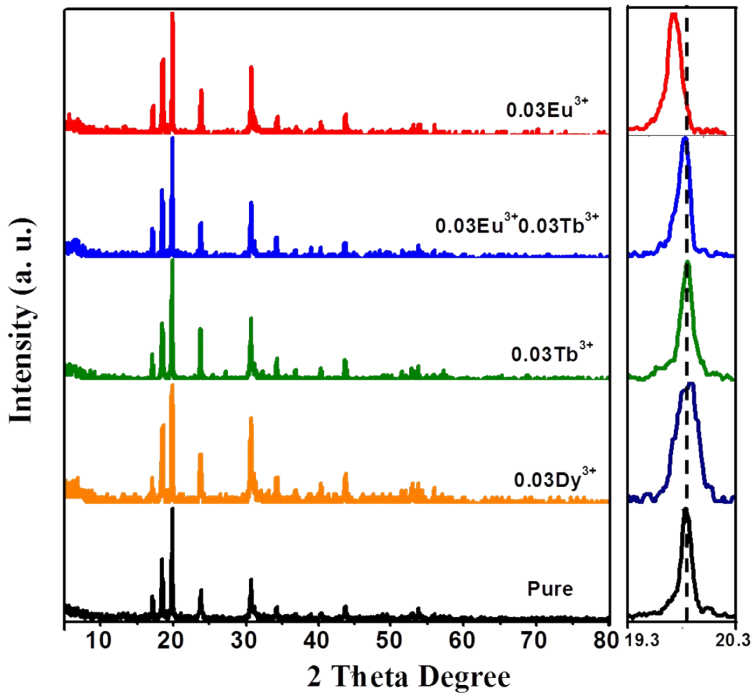

Fig. S3. XRD patterns of Eu^{3+},Tb^{3+},Eu^{3+}/Tb^{3+},Dy^{3+} doped in $ScPO_4 \cdot 2H_2O$ and the pure sample.

Table S2 The unit cell parameters of $ScPO{\cdot}2H_2O$ doped with $0.03Ln^{3+}$(Ln^{3+}=Dy, Tb, Eu and Eu/Tb)

Dopant	*Pure*	$0.03Dy^{3+}$	$0.03Tb^{3+}$	$0.03Eu^{3+}0.03Tb^{3+}$	$0.03Eu^{3+}$
a (Å)	5.4091	5.3907	5.4256	5.4680	5.4084
b (Å)	10.3585	10.3981	10.3400	10.3000	10.4100
c (Å)	8.9434	8.9433	8.9460	8.9700	8.9921
v (Å³)	501.1002	501.2991	501.8769	505.1940	506.2682

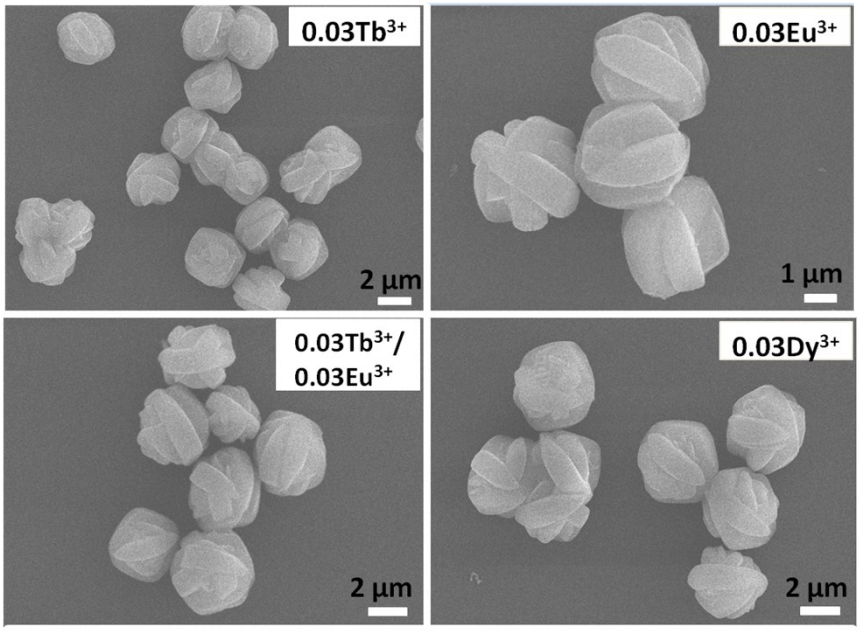

Fig. S4 SEM images of $0.03Eu^{3+}$, $0.03Tb^{3+}$, $0.03Dy^{3+}$ and $0.03Eu^{3+}/0.03Tb^{3+}$ doped in $ScPO_4{\cdot}2H_2O$.

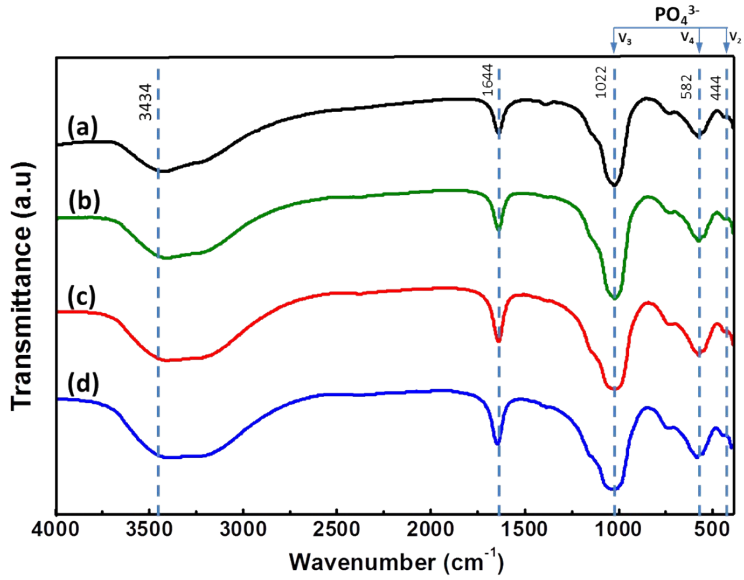

Fig. S5 FTIR spectra of pure $ScPO_4{\cdot}2H_2O$(a), doped with $0.03Eu^{3+}$(b), $0.03Tb^{3+}$ (c) and $0.03Dy^{3+}$ (d)

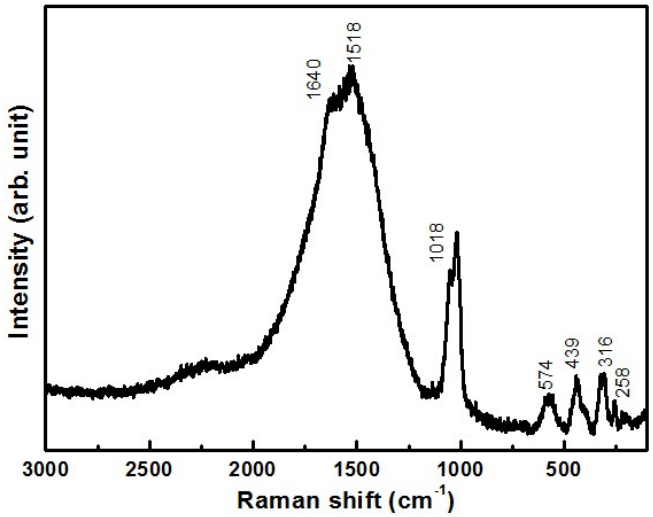

Fig. S6 Raman spectra of the pure $ScPO_4 \cdot 2H_2O$. The strong and dominant band peaking from 1640~ 1518cm^{-1} :O-H bending vibrations,1018cm^{-1}:PO_4^{3-}(v3 mode), 574 cm^{-1}: PO_4^{3-} (V_4 mode),439 cm^{-1} : PO_4^{3-} (V_2 mode), 316 and 258 cm^{-1}:lattice vibration of Sc_2O_3

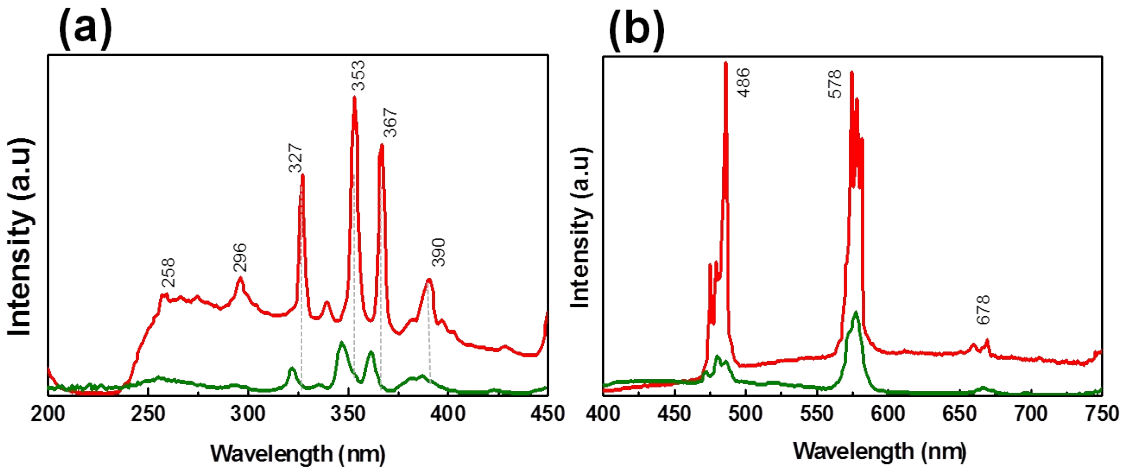

Fig.S7 (a) PL and (b) PL emisstion comparsion between the sample $ScPO_4 \cdot 2H_2O$: 0.03Dy^{3+} before(green line) and after calcination

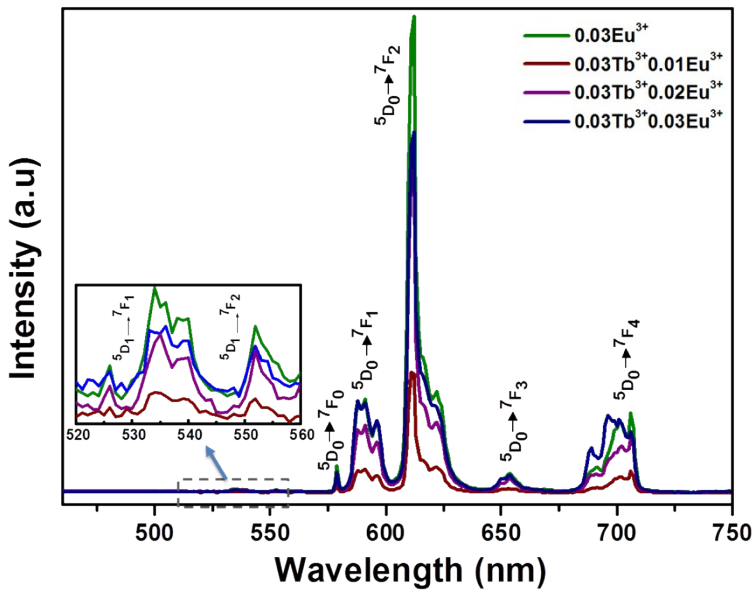

Fig. S8 Emission spectra of $ScPO_4 \cdot 2H_2O$: 0.03Eu and $0.03Tb^{3+}$, xEu^{3+} (x=0,0.01, 0.02, 0.03) samples under excitation at 393nm.

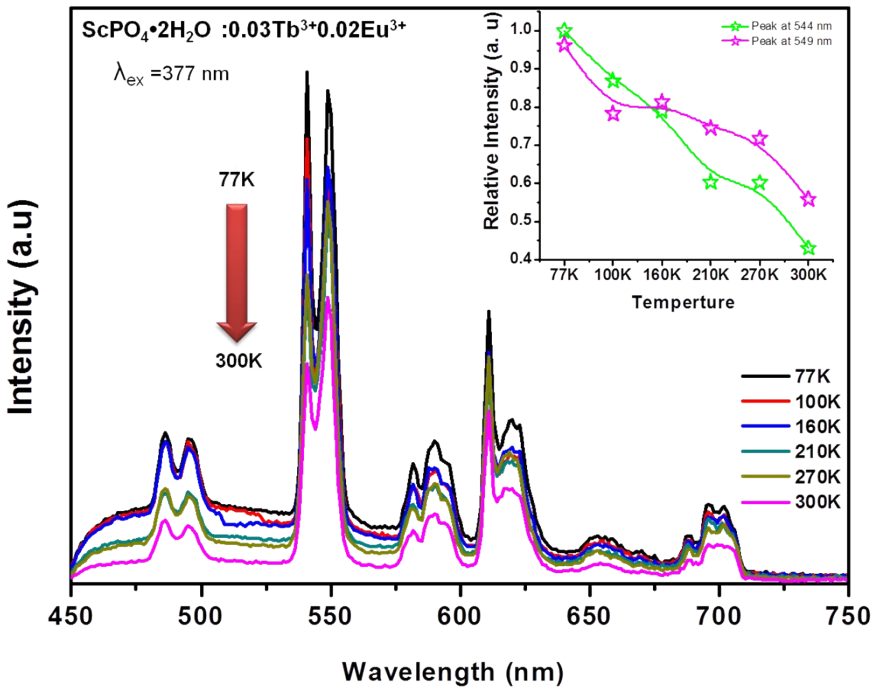

Fig. S9 Temperature depent PL emission spectra of $ScPO_4 \cdot 2H_2O$: 0.03Tb0.02Eu from 77–400 K under λ = 377 nm excitation.