Electronic supporting information

Multicomponent hybrids with surfactant-capped lanthanide polyoxometalate and ZIF-8 to tune luminescence

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Elemental analyses data: For $SEuW_{10}$-ZIF-8-PEMA (%): Eu 1.80, Zn 7.15, C 45.31, H 6.45; N 6.30; for $STbW_{10}$-ZIF-8-PEMA(%): Tb 1.93, Zn 7.11, C 45.02, H 6.33; N 6.26; for $SSmW_{10}$-ZIF-8-PEMA (%): Sm 1.78, Zn 7.15, C 45.30, H 6.29; N 6.44; for $SDyW_{10}$-ZIF-8-PEMA (%): Dy 1.95, Zn 7.10, C 44.90, H 6.27; N 6.22; for $SEuSiW_{11}$-ZIF-8-PEMA (%): Eu 1.20, Zn 4.75, C 36.31, H 5.93; N 4.65; for $SSmSiW_{11}$-ZIF-8-PEMA (%): Sm 1.20, Zn 4.77, C 36.45, H 5.93; N 4.59; for $SDySiW_{11}$-ZIF-8-PEMA (%): Dy 1.27, Zn 4.71, C 36.03, H 5.85; N 4.45.

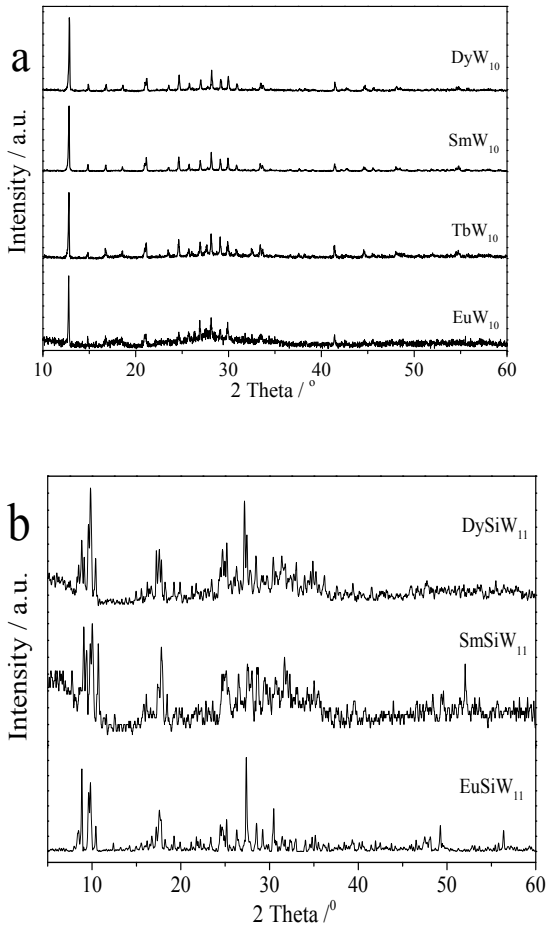

Figure S1 X-ray diffraction patterns of $Na_9EuW_{10}O_{36}\cdot 32H_2O$ (a), and $K_{13}Ln(SiW_{11}O_{39})_2\cdot 30H_2O$ (b).

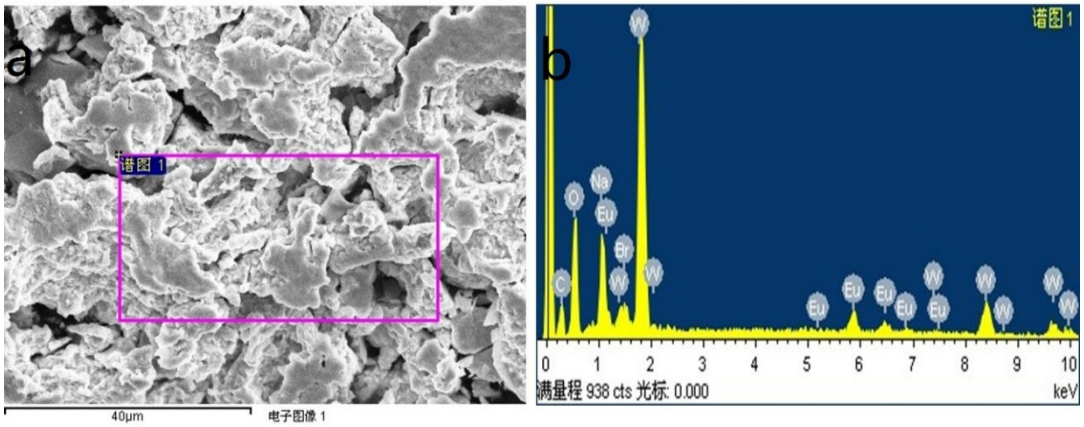

Figure S2 The scanning electron microscope (SEM) **(a)** and energy dispersive spectrometer (EDS) **(b)** analysis of the $SEuW_{10}$.

Table S1 The weight percent and atomic percent of elements in the $SEuW_{10}$.

element	*weight percent*	*atomic percent*
C	8.00	29.28
O	16.53	45.41
Na	3.79	7.24
Br	1.44	0.79
Eu	9.57	2.77
W	60.66	14.50
total	100.00	

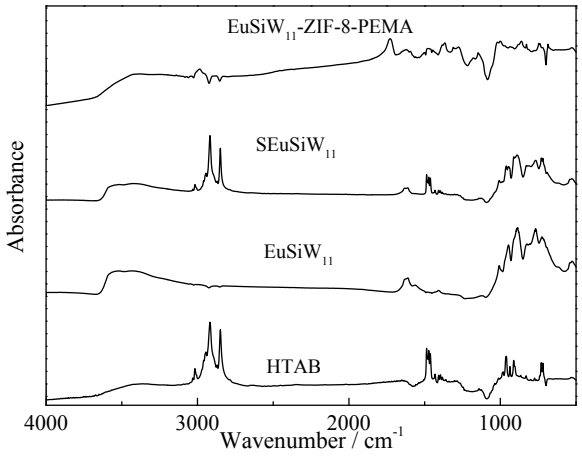

Figure S3 Selected FTIR spectra of HTAB, $EuSiW_{11}$, $SEuSiW_{11}$ and $SEuSiW_{11}$-ZIF-8-PEMA

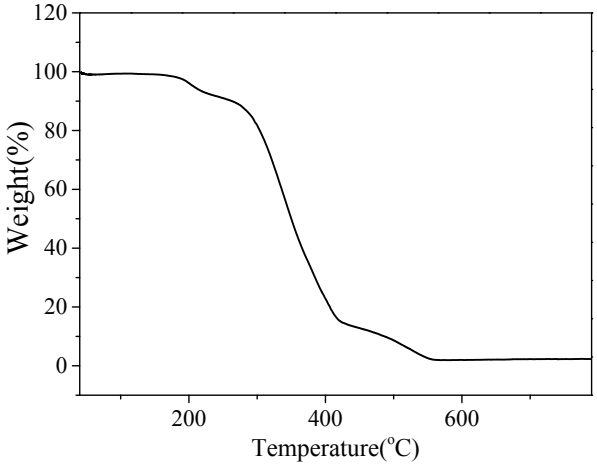

Figure S4 TGA trace of hybrid material of $SEuW_{10}$-ZIF-8-PEMA.

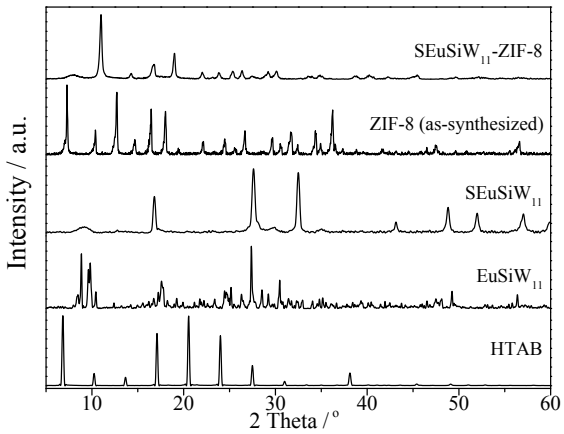

Figure S5 Wide-angle X-ray Diffraction pattern of HTAB, $EuSiW_{11}$, $SEuSiW_{11}$, ZIF-8 and $SEuSiW_{11}$-ZIF-8-PEMA

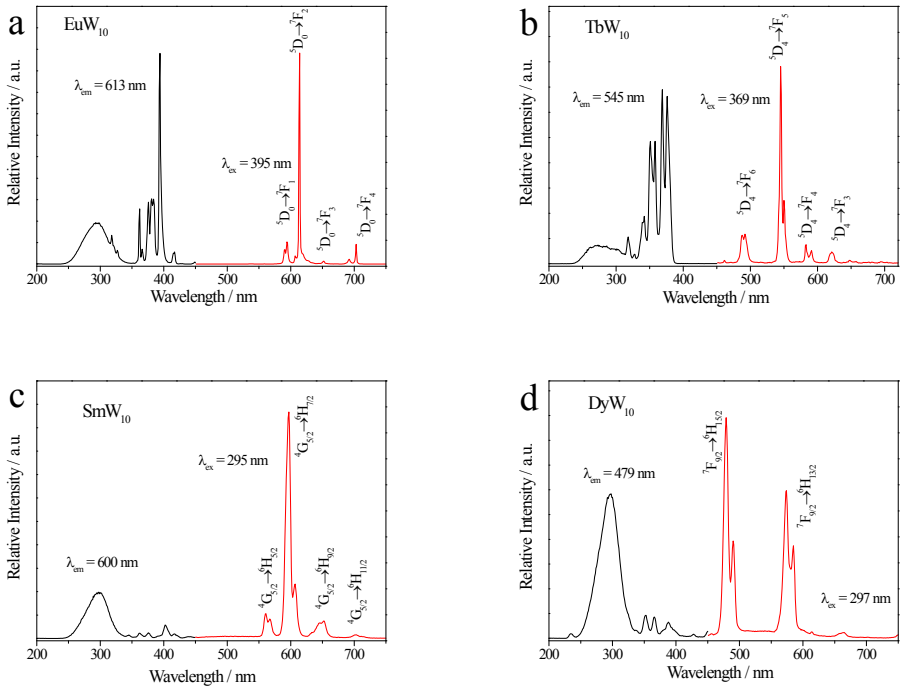

Figure S6 The excitation and emission spectra of EuW_{10} (a), TbW_{10} (b), SmW_{10} (c) and DyW_{10} (d).

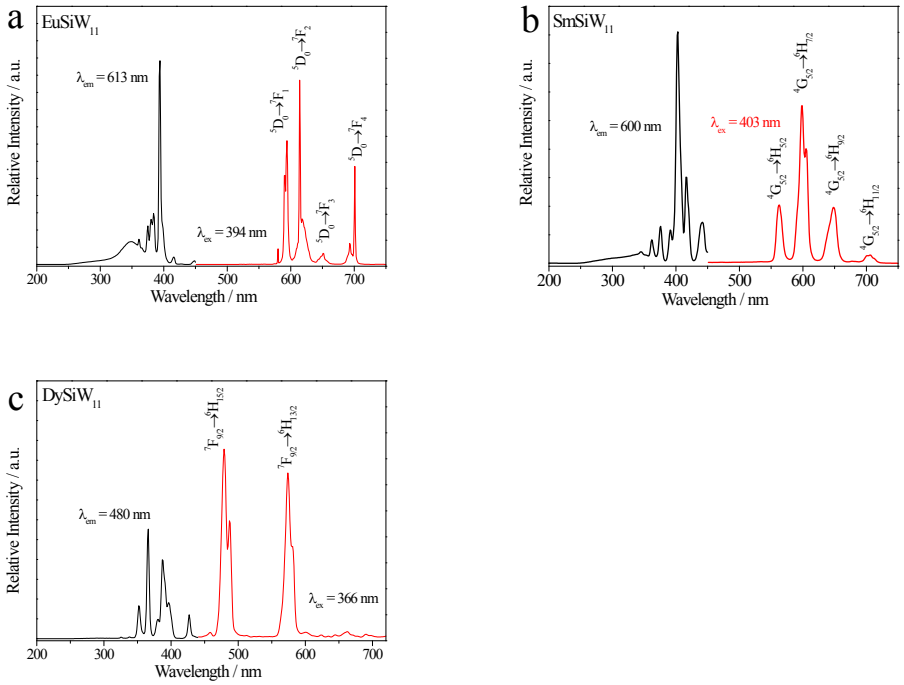

Figure S7 The excitation and emission spectra of $EuSiW_{11}$ (a), $SmSiW_{11}$ (b) and Dy SiW_{11} (c).

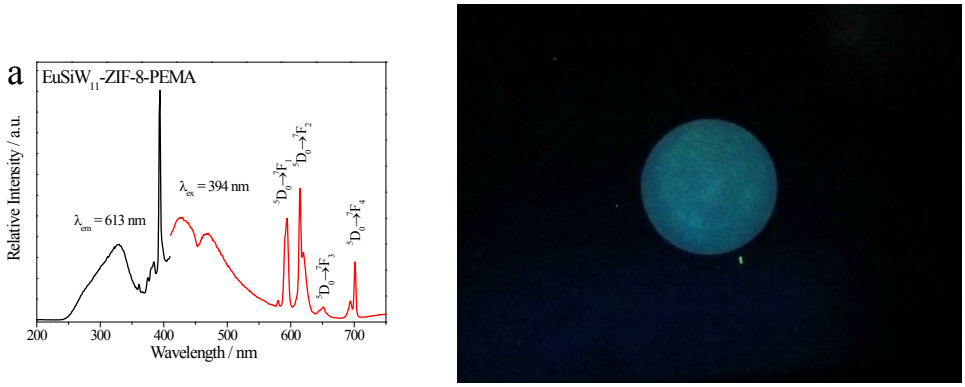

Figure S8 The excitation and emission spectra of SEuSiW$_{11}$-ZIF-8-PEMA (a) and the digital photograph of SEuSiW$_{11}$-ZIF-8-PEMA by a 394 nm irradiated in dark (b).

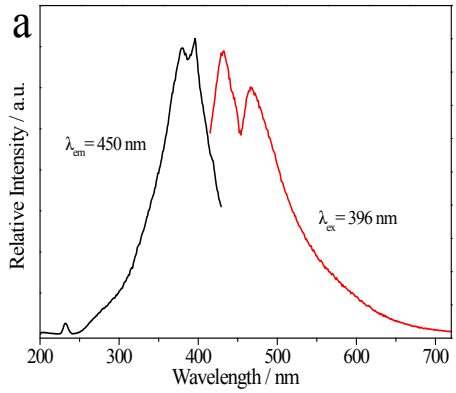

Figure S9 The luminescent excitation and emission spectra of ZIF-8.

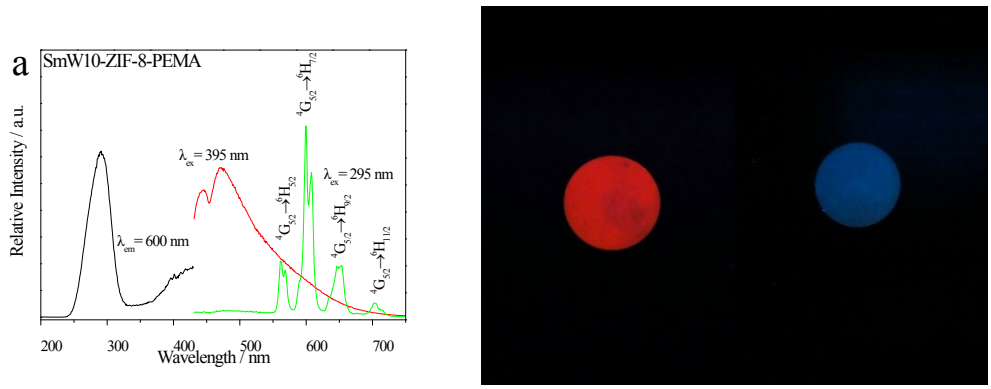

Figure S10 The excitation and emission spectra of SSmW$_{10}$-ZIF-8-PEMA (a), the digital photograph of SSmW$_{10}$-ZIF-8-PEMA by a 295 nm irradiated (b) and 395 nm (c) in dark, respectively.

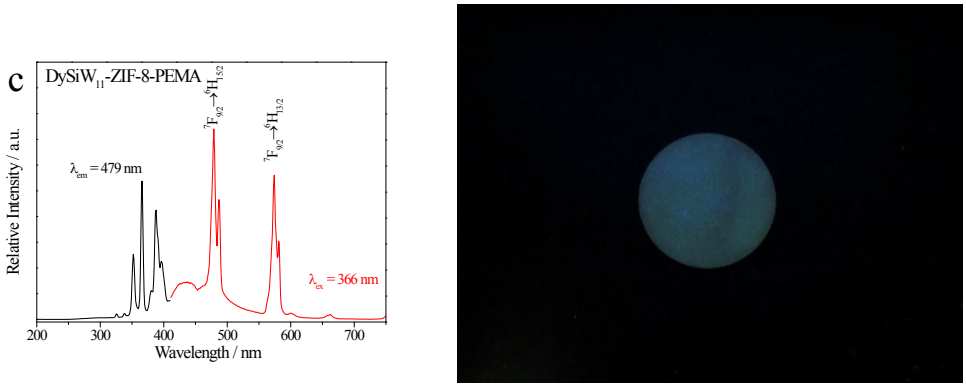

Figure S11 The excitation and emission spectra of SDySiW$_{11}$-ZIF-8-PEMA (a), the digital photograph of SDySiW$_{11}$-ZIF-8-PEMA by a 366 nm irradiated (b) in dark, respectively.

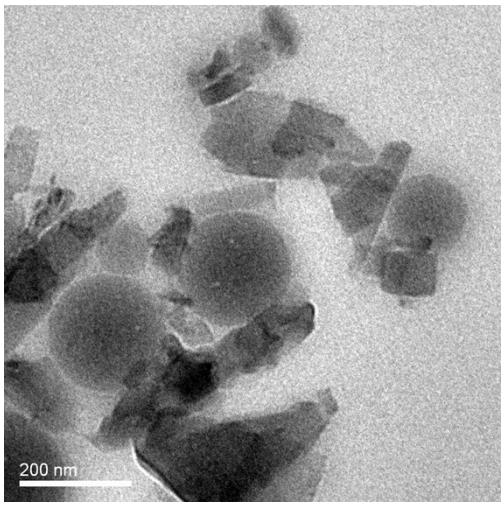

Figure S12 The transmission electron microscopy (TEM) of SEuW10-ZIF-8-PEMA.

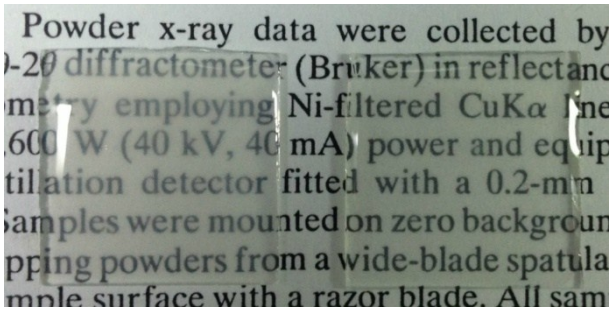

Figure S13 Photographs of the transparent thin films, SEuW$_{10}$-ZIF-8-PEMA **(a)** and SEuSiW$_{11}$-ZIF-8-PEMA **(b)** respectively.