

Electronic Supporting Information

Polymer hybrid thin films based on rare earth ion- functionalized MOF: photoluminescence tuning and sensing as temperature thermometer

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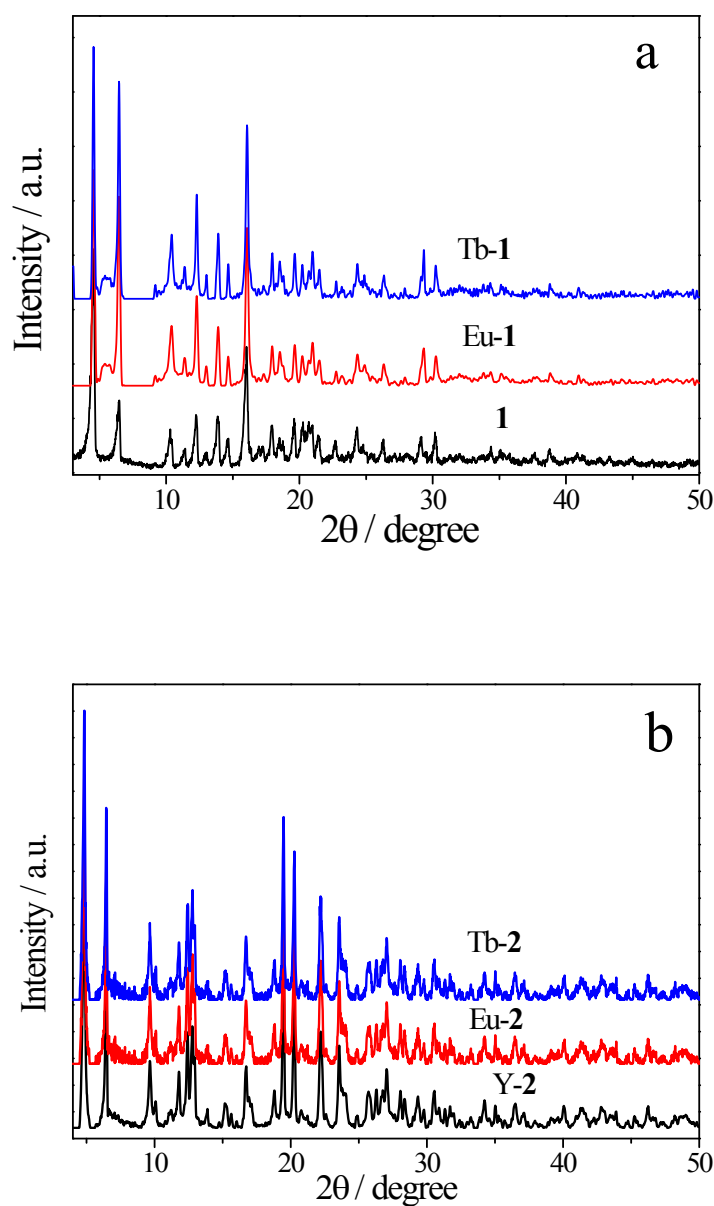


Figure S1 PXRD patterns of **1** and RE- **1** (a), Y-**2** and RE-**2**(b) powder samples

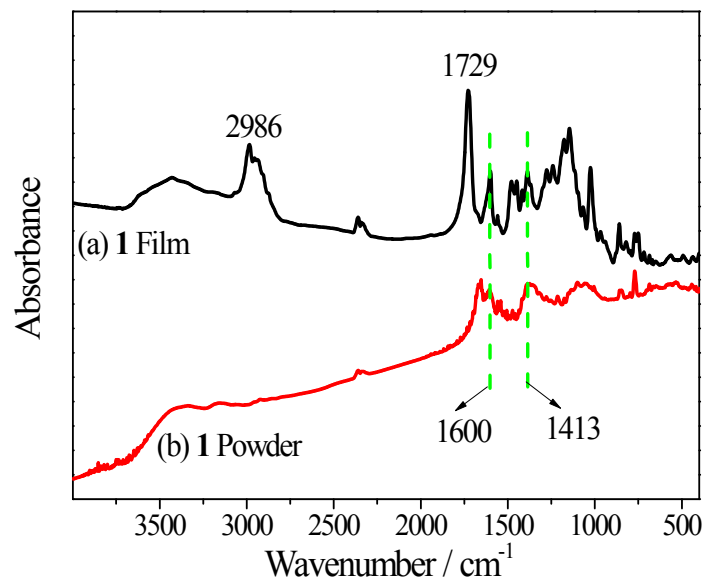


Figure S2 FT-IR spectrum of **1** thin film (a) and powder (b)

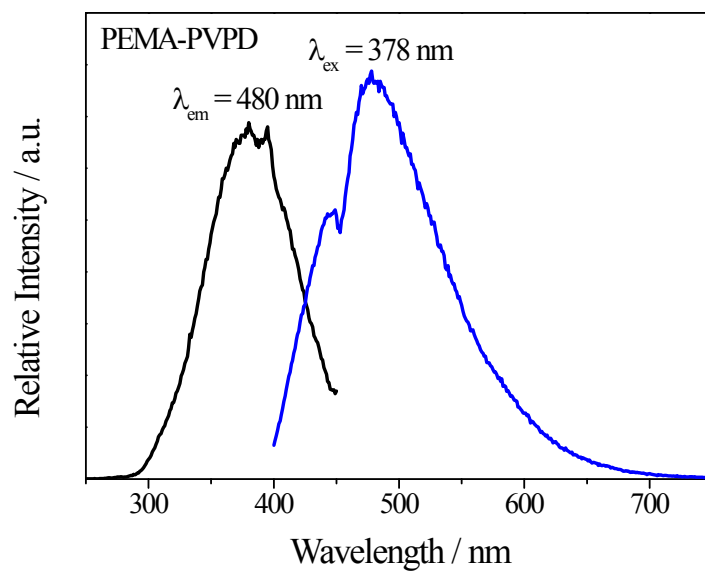


Figure S3 The excitation (black) and emission (blue) spectra of pure PEMA-PVPD ($\lambda_{\text{ex}} = 378$ nm, $\lambda_{\text{em}} = 480$ nm)

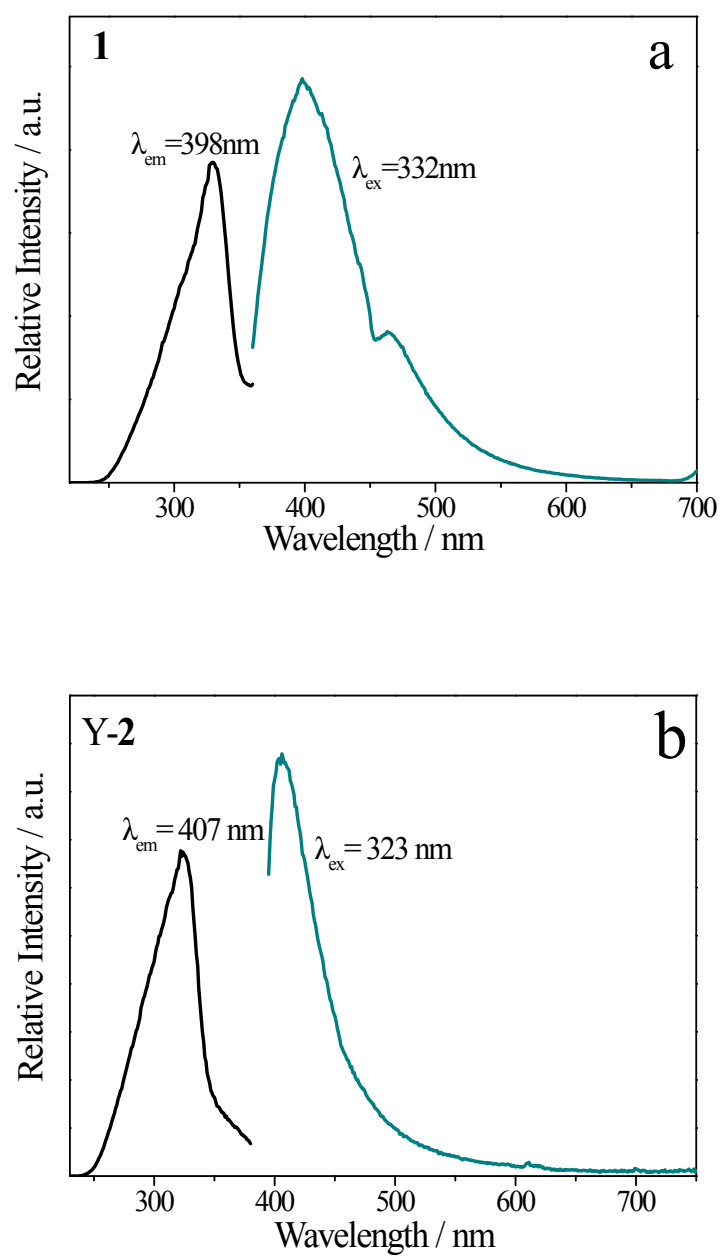


Figure S4 The excitation (black) and emission (dark cyan) spectra of **1** ($\lambda_{ex} = 332\text{ nm}$, $\lambda_{em} = 398\text{ nm}$) (a) and **Y-2** ($\lambda_{ex} = 323\text{ nm}$, $\lambda_{em} = 407\text{ nm}$) (b) powders

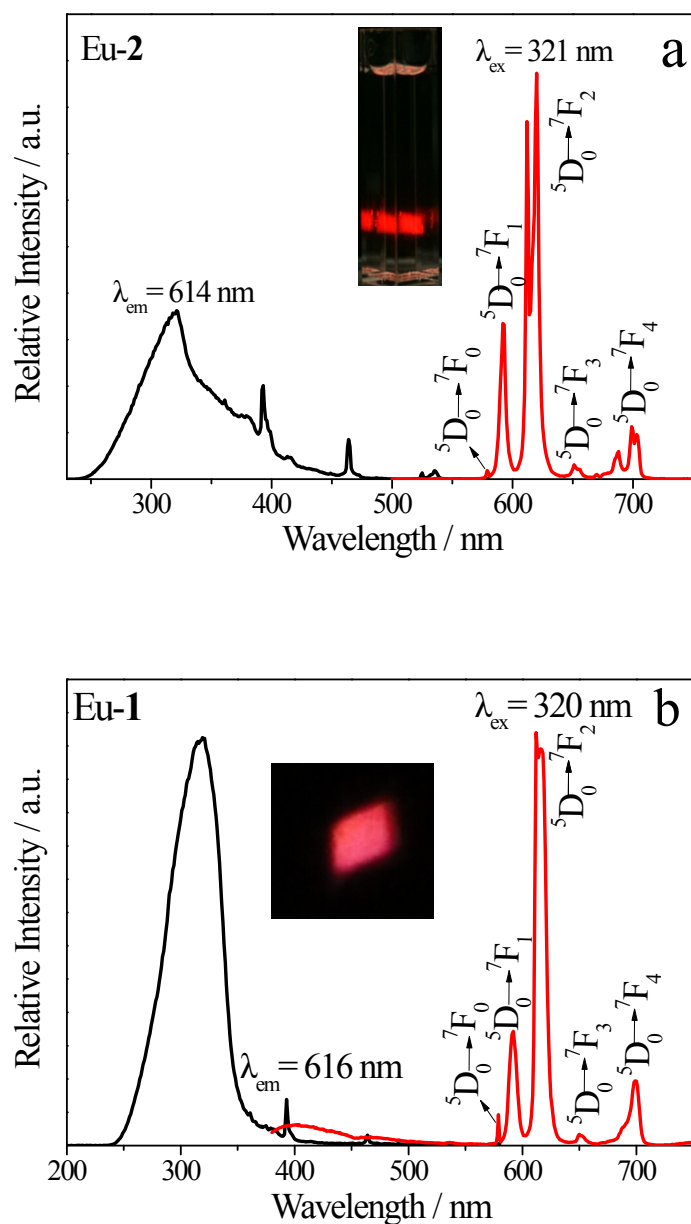


Figure S5 The excitation (black) and emission (red) spectra of Eu- 2 ($\lambda_{ex} = 321$ nm, $\lambda_{em} = 614$ nm) (a) and Eu-1 ($\lambda_{ex} = 320$ nm, $\lambda_{em} = 616$ nm) (b) powder samples; the insets are photographs of (a) and (b) displaying red colors under Xe lamp.

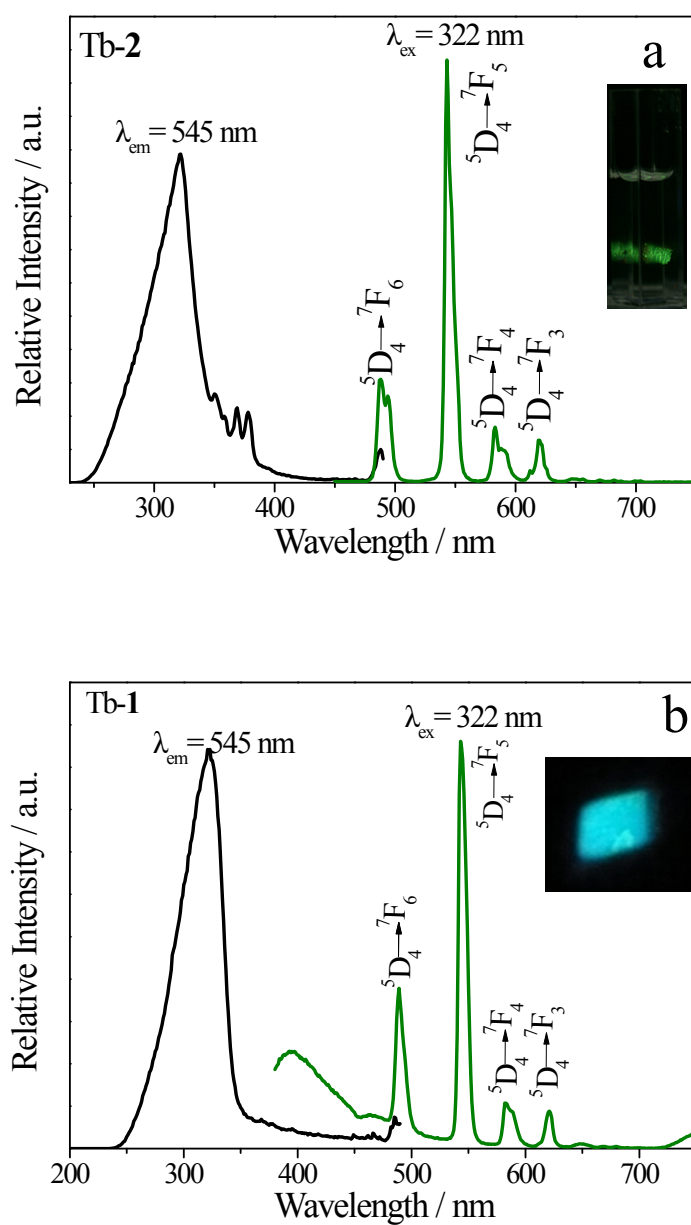


Figure S6 The excitation (black) and emission (green) spectra and photographs of Tb-2 ($\lambda_{ex} = 322$ nm, $\lambda_{em} = 545$ nm) (a) and Tb-1 ($\lambda_{ex} = 322$ nm, $\lambda_{em} = 545$ nm) (b) powder samples

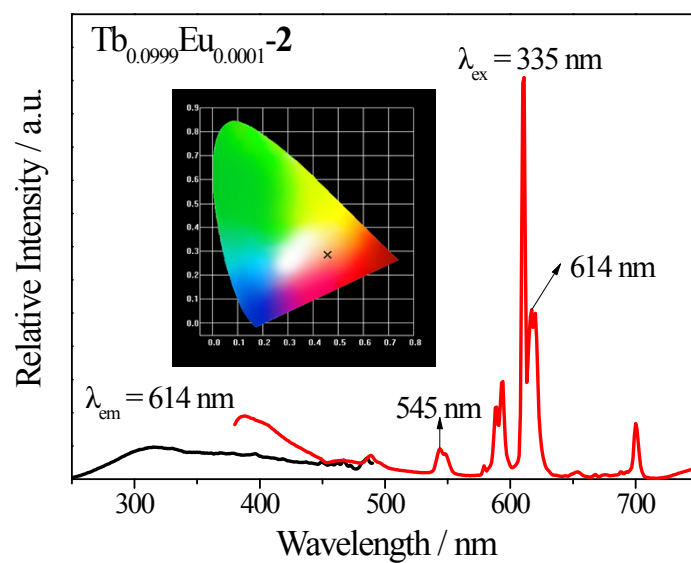


Figure S7 The excitation ($\lambda_{\text{ex}} = 335$ nm) and emission ($\lambda_{\text{em}} = 614$ nm) spectra of $\text{Tb}_{0.0999}\text{Eu}_{0.0001}\text{-2}$ powder and the inset is its CIE chromaticity diagram ($x = 0.4473$, $y = 0.2797$)

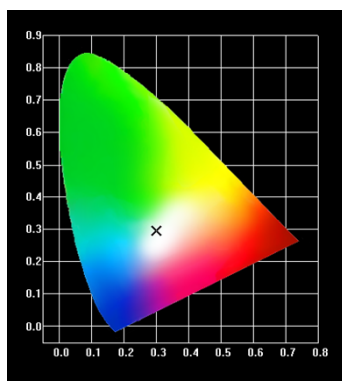


Figure S8 The CIE chromaticity diagram of $\text{Tb}_{0.0999}\text{Eu}_{0.0001}\text{-2}$ thin film showing the color is white ($x = 0.3$, $y = 0.2951$)

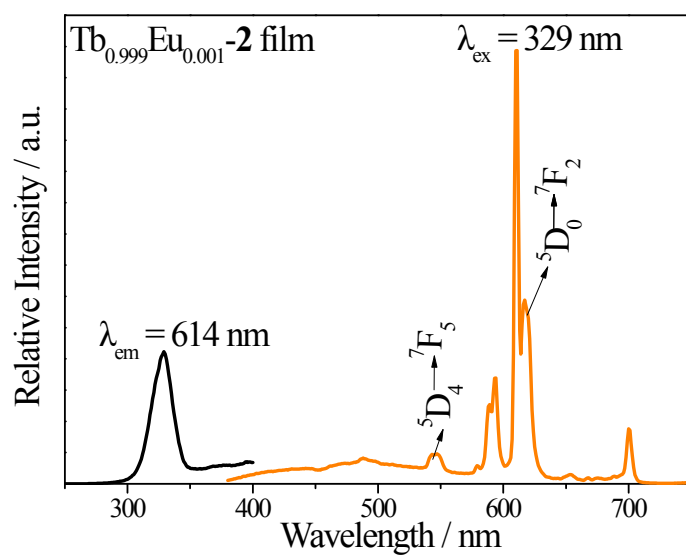


Figure S9 The excitation ($\lambda_{\text{ex}} = 329 \text{ nm}$) and emission ($\lambda_{\text{em}} = 614 \text{ nm}$) spectra of Tb_{0.999}Eu_{0.001}-2 powder

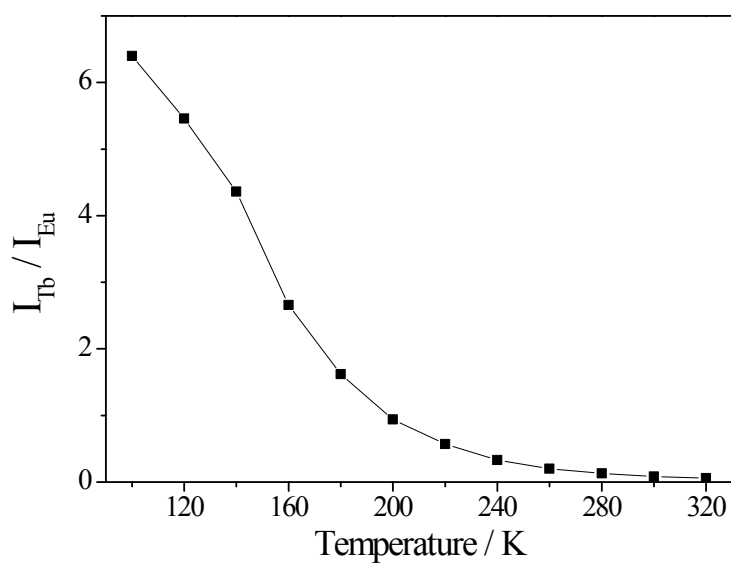


Figure S10 The original fitted curve of the intensity ratio ($I_{\text{Tb}}/I_{\text{Eu}}$) for Tb_{0.999}Eu_{0.001}-2 thin film from 100 to 320 K

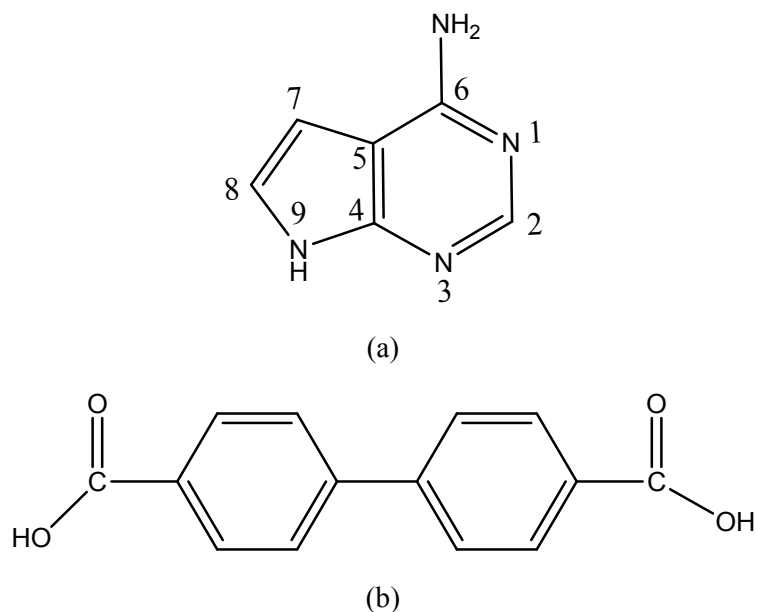


Figure S11 The chemical structures of adenine (a) and biphenyl-4,4'-dicarboxylic acid (b)

Table S1 The luminescence data of polymer thin films

Materials (thin films)	λ_{ex} (nm)	λ_{em} (nm)	Color (CIE-X,Y)	η (%)	τ (μ s)
2	371	445	Blue (0.1975, 0.2739)	42.0	
Eu-2	322	614	Red (0.4408, 0.2972)	16.7	1229
Tb-2	321	545	Green (0.2848, 0.4795)	14.6	385
1	351	468	Blue (0.2094, 0.2879)	28.8	
Eu-1	317	616	Red (0.4713, 0.2874)	16.0	
Tb-1	300	545	Blue-green (0.2336, 0.3722)	13.2	
Tb _{0.0999} Eu _{0.0001} -2	329	614	White (0.3, 0.2951)	9.5	
Tb _{0.999} Eu _{0.001} -2	329	614	Pink (0.3701, 0.2467)	27.3	1322 (614) 270 (545)

η - the emission quantum efficiency

τ - luminescence lifetime