

Supporting Information

Color-tunable luminescent hydrogels with tough mechanical strength and self-healing ability

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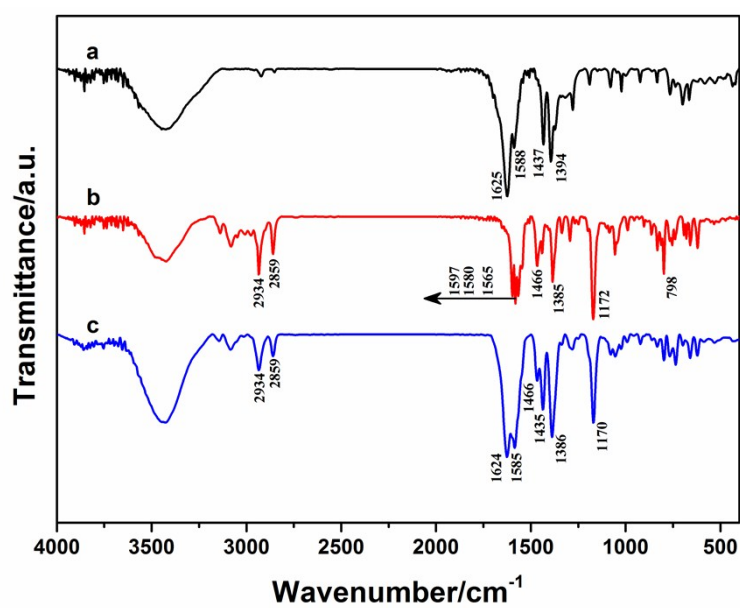


Figure S1. FT-IR spectra of Na₃[Ln(dpa)₃] (a), tpy-mim₂ (b), and Ln(dpa)₃-tpy-mim₂ (c).

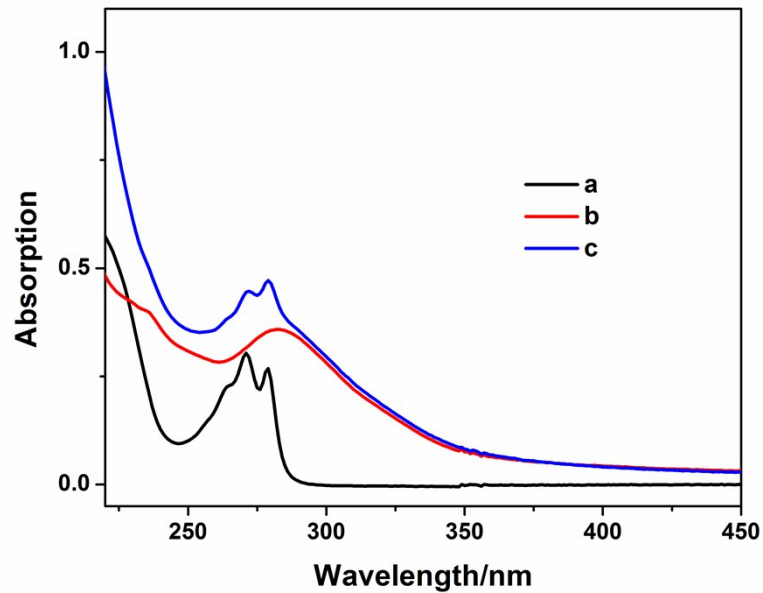


Figure S2. UV-Vis absorption spectra of Na₃[Ln(dpa)₃] (a), tpy-mim₂ (b), and Ln(dpa)₃-tpy-mim₂ (c).

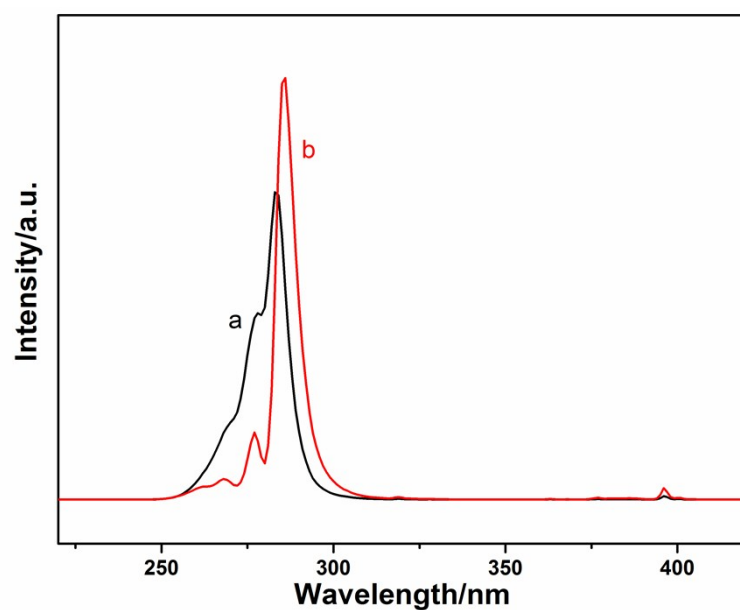


Figure S3. The excitation spectra of $\text{Na}_3[\text{Ln}(\text{dpa})_3]$ (a) and $\text{Ln}(\text{dpa})_3\text{-tpy-mim}_2$ (b).

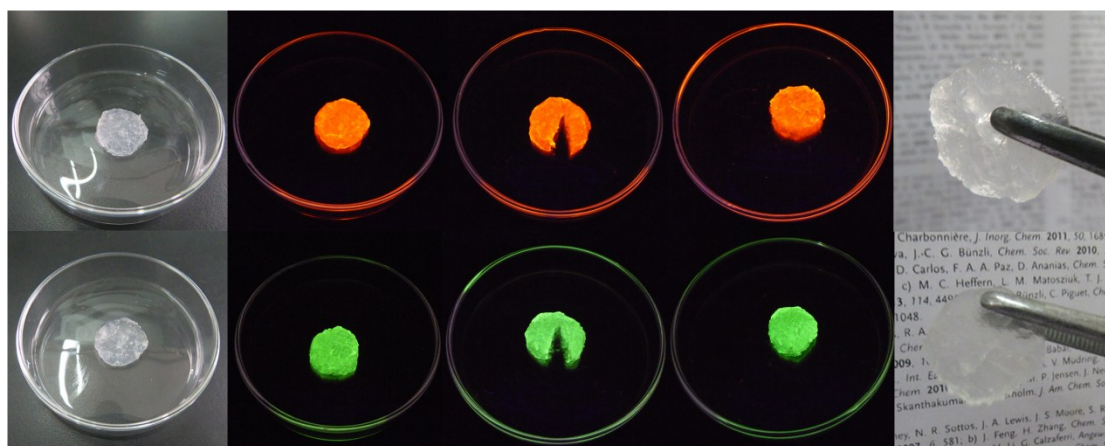


Figure S4. Pictures of $\text{Ln}\cdot\mathbf{1}$ ($\text{Ln}=\text{Eu}, \text{Tb}$) under 254 nm UV lamp illumination and daylight. (Red: $\text{Eu}\cdot\mathbf{1}$; Green: $\text{Tb}\cdot\mathbf{1}$).

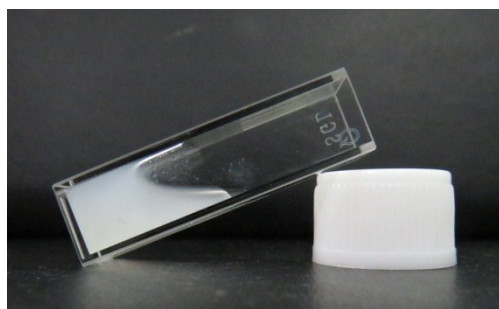


Figure S5. Digital photo of Ln-tpy-mim_2 aqueous solution with ASAP exfoliated clay

nanosheets. Ascribe to the lack of spherical micelles, no gelation was observed.

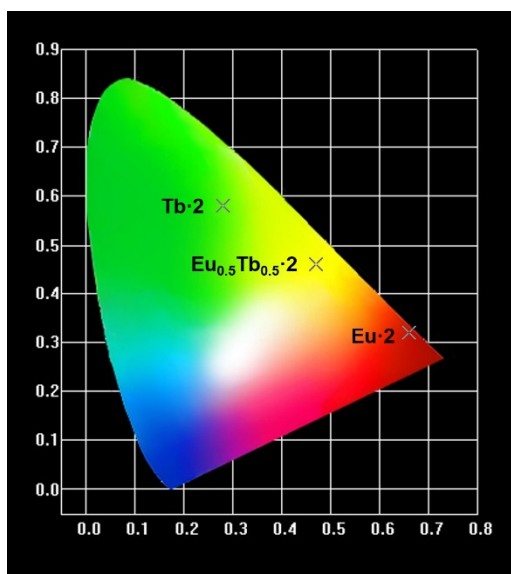


Figure S6. CIE 1931 chromaticity diagram within the coordinates of **Ln·2** (Ln=Eu, Tb, or Eu and Tb in molar ratio as 1:1) under 254 nm UV lamp illumination.

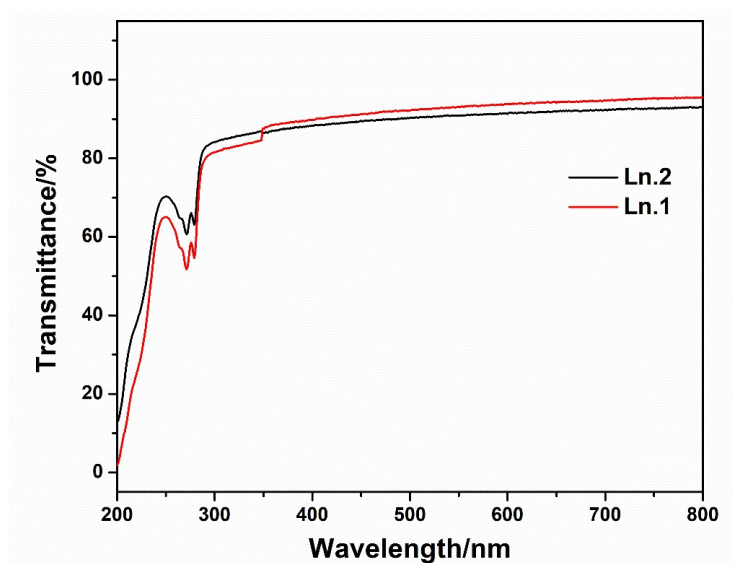


Figure S7. UV-vis transmittance spectra of PVA-containing hydrogels **Ln·2** (black) and PVA-free analogues **Ln·1** (red).

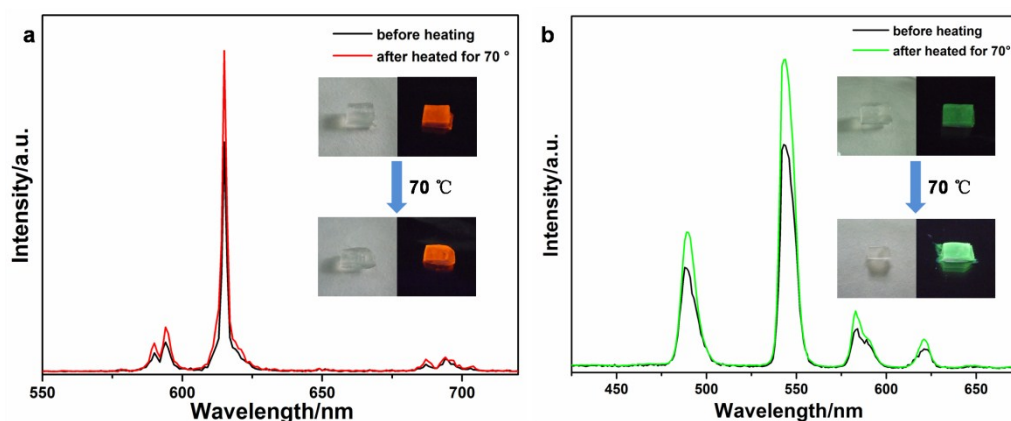


Figure S8. Luminescence emission spectra of hydrogels **Eu·2** (a), **Tb·2** (b) before heating and after heated to 70 °C for 10 min. Inset: Pictures of hydrogels under before heating and after heated to 70 °C for 10 min (under 254 nm UV lamp illumination).

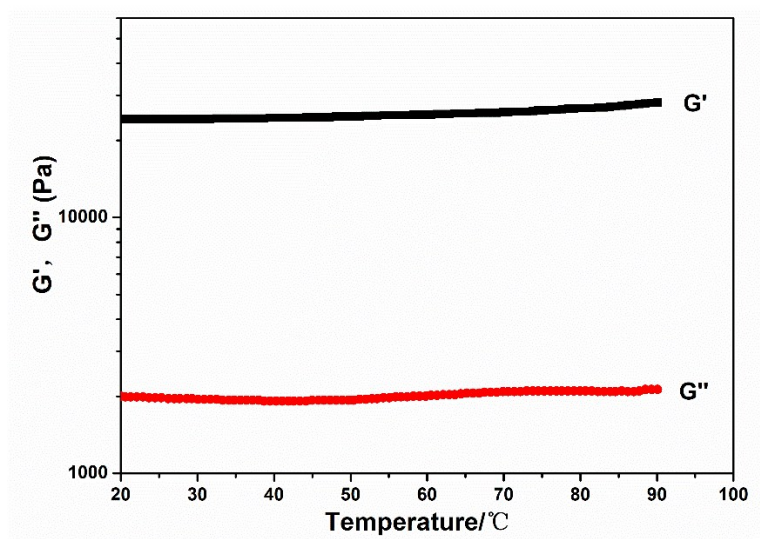


Figure S9. Rheological properties of **Ln·2**: Frequency (ω) sweep tests at $\omega=6.28$ rad s^{-1} and strain (γ) = 0.5% of the supramolecular hydrogels at varying temperature from 20 °C to 90°C.

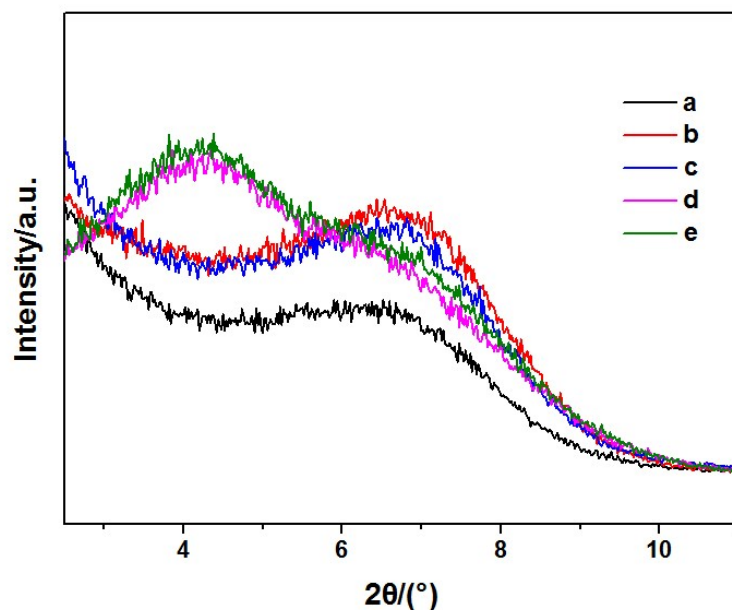


Figure S10. XRD spectra of pure clay (a); clay-ASAP (b); clay-PVA (c); **Ln·1** (d); **Ln·2** (e).

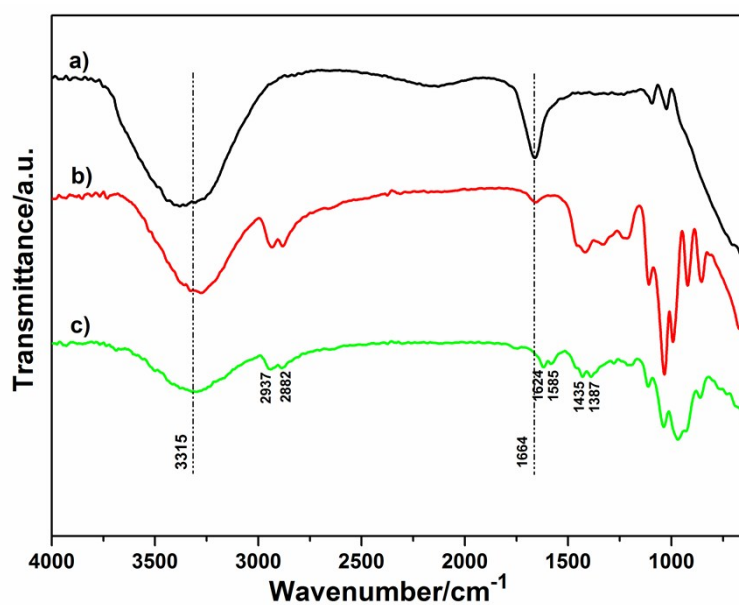


Figure S11. IR spectra of hydrogels **Ln·2** (a) and the resultant organogels from glycerol (b) and THF (c).