Electronic Supplementary Material (ESI) for Inorganic Chemistry Frontiers.

Supporting Information

for

Hydrogels with Both Mechanical Strength and Luminescence Anisotropy

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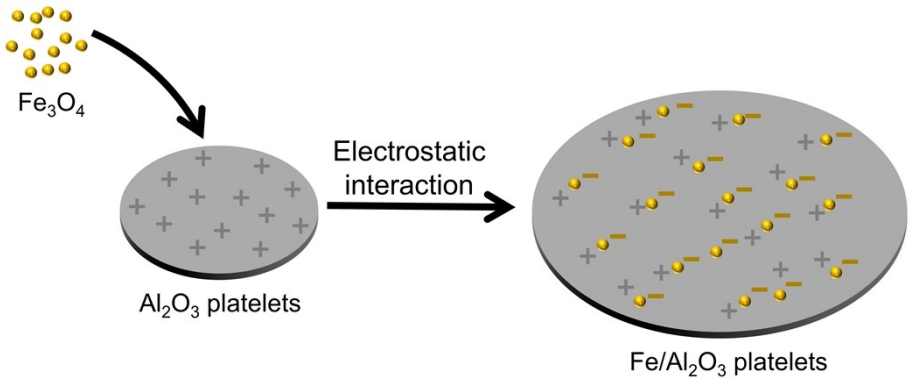


Figure S1. Preparative route of Fe/Al_2O_3 platelets.

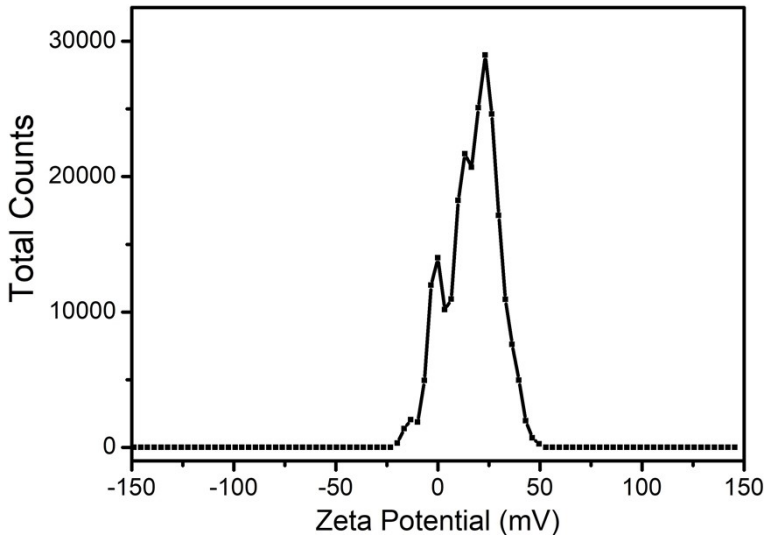


Figure S2. Zeta potential of pristine Al_2O_3 platelets in deionized water (ζ = 16.9 mV).

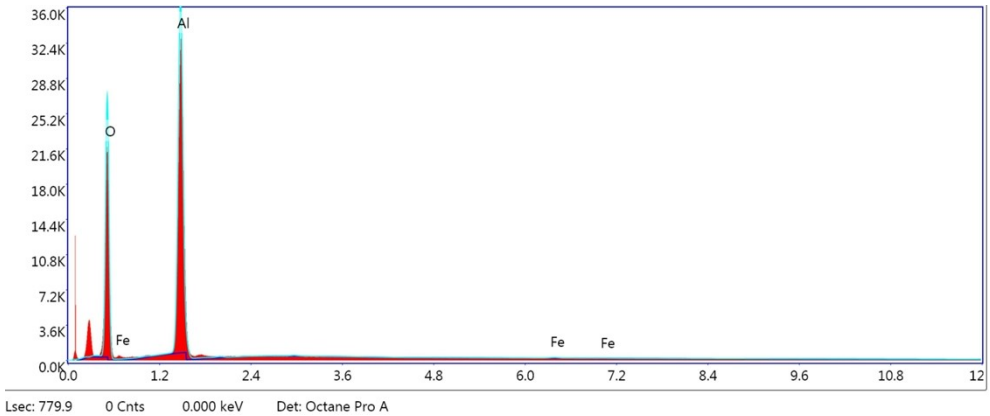


Figure S3. EDS spectrum of Fe/Al_2O_3 platelets.

Table S1. Elemental composition of Fe/Al_2O_3 platelets.

Element	Weight %	Atomic %
O	50.38	63.25
Al	49.13	36.58
Fe	0.49	0.18

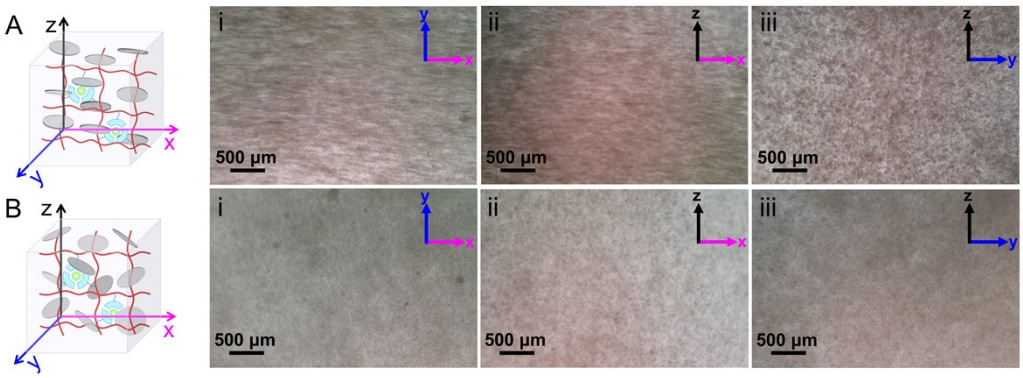


Figure S4. Optical microscope images of Tb-containing hydrogel in different directions.

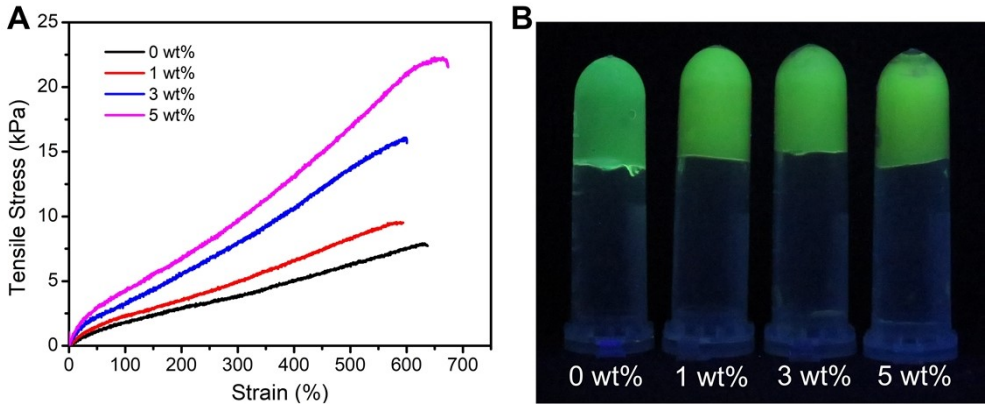
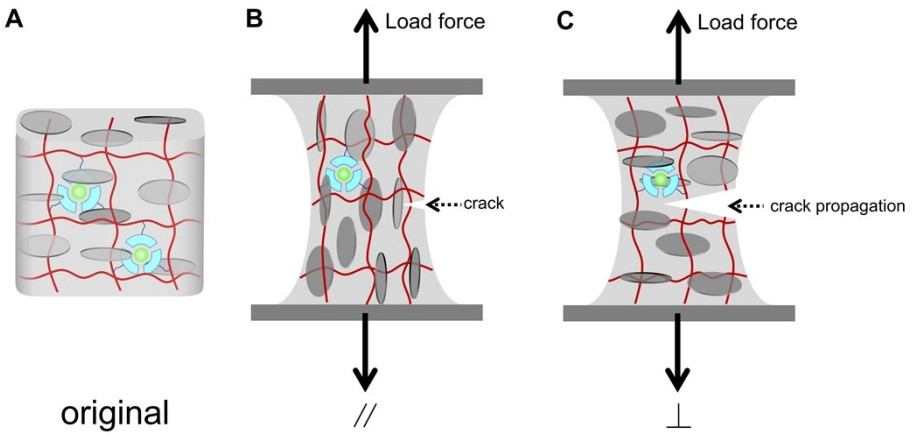
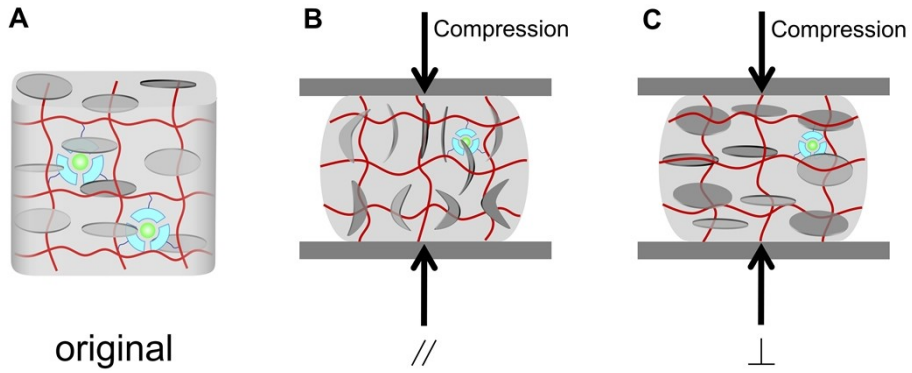


Figure S5. (A) Tensile stress-strain and (B) photos (under 254 nm UV light) of Tb-containing hydrogel with different contents of Fe/Al_2O_3 platelets.



Scheme S1. Schematic illustration of Tb-containing hydrogel (A) original, tensile force was (B) parallel and (C) perpendicular to the oriented Fe/Al_2O_3 platelets.



Scheme S2. Schematic illustration of Tb-containing hydrogel (A) original, compressive force was (B) parallel and (C) perpendicular to the oriented Fe/Al_2O_3 platelets.

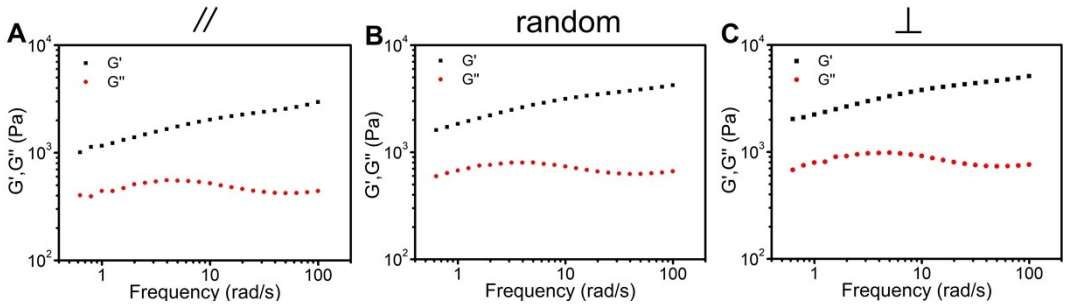


Figure S6. Frequency (ω) sweep tests at ω = 0.1-100 rad s^{-1} and strain (γ) = 1.0% of Tb-containing hydrogel.

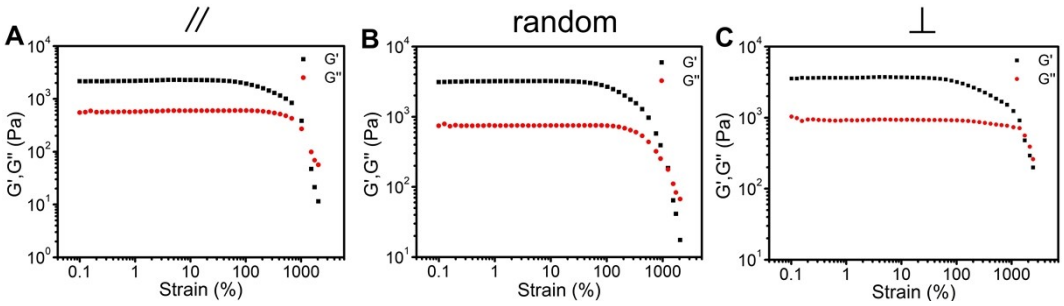


Figure S7. Strain sweep tests at γ = 0.1-2000% with ω = 1.59 Hz of Tb-containing hydrogel.

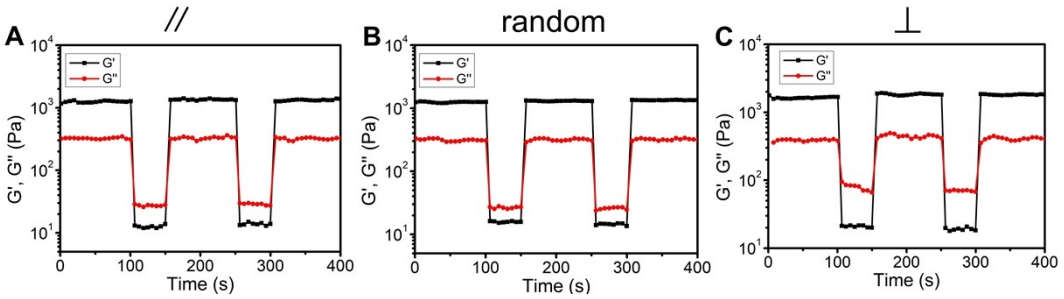


Figure S8. Continuous step strain test of Tb-containing hydrogel at γ = 0.1 and 800% with ω = 1.59 Hz.

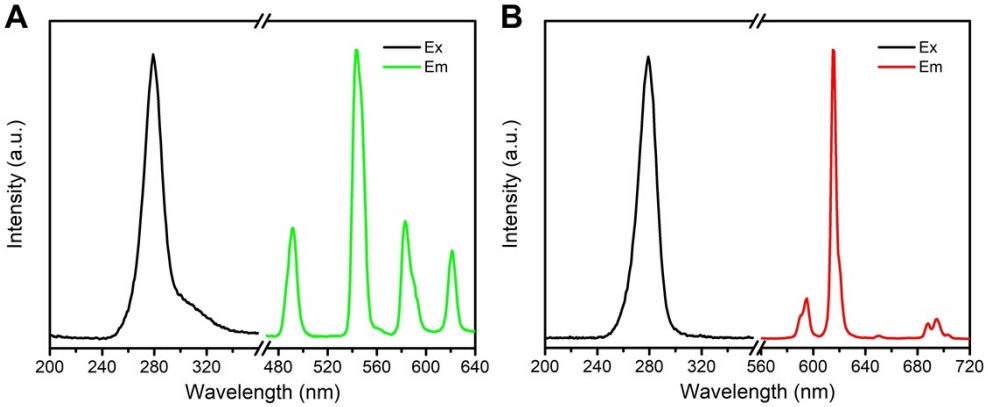


Figure S9. Normalized excitation (λ_{mon} = 544 nm for Tb, 615 nm for Eu) (left) and emission ((λ_{ex} = 280 nm)) (right) luminescence spectra of (A) Tb-containing and (B) Eu-containing hydrogel.

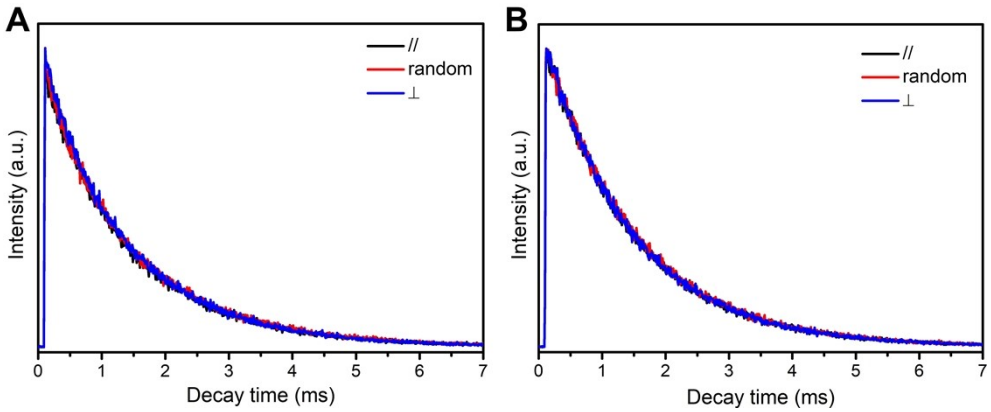


Figure S10. Decay curves of (A) Tb-containing (excited at 280 nm and monitored at 544 nm) and (B) Eu-containing (excited at 280 nm and monitored at 615 nm) hydrogel along different direction.

Table S2. Luminescence quantum efficiency (Φ) and lifetime (τ) of Tb-containing and Eu-containing hydrogel.

Sample		∥	random	⊥
Tb-containing hydrogel	τ (ms)	1.33	1.36	1.31
	Φ (%)	4.87	4.91	4.40
Eu-containing hydrogel	τ (ms)	1.41	1.43	1.40
	Φ (%)	13.04	12.28	12.55