Supporting Information

Mechanical Tough, Multicolor Aggregation-Induced Emissive Polymeric Hydrogels for Fluorescent Patterning

Yi Zhang[ab], Ruijia Wang[b], Wei Lu[b]*, Wanning Li[b], Si Chen[a]*, Tao Chen[b]*

[a] College of Material Science and Engineering, Zhejiang University of Technology, Hangzhou 310014, Zhejiang, China

[b] Key Laboratory of Marine Materials and Related Technologies, Zhejiang Key Laboratory of Marine Materials and Protective Technologies, Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, Ningbo 315201, China

E-mail: chensi@zjut.edu.cn, luwei@nimte.ac.cn, tao.chen@nimte.ac.cn

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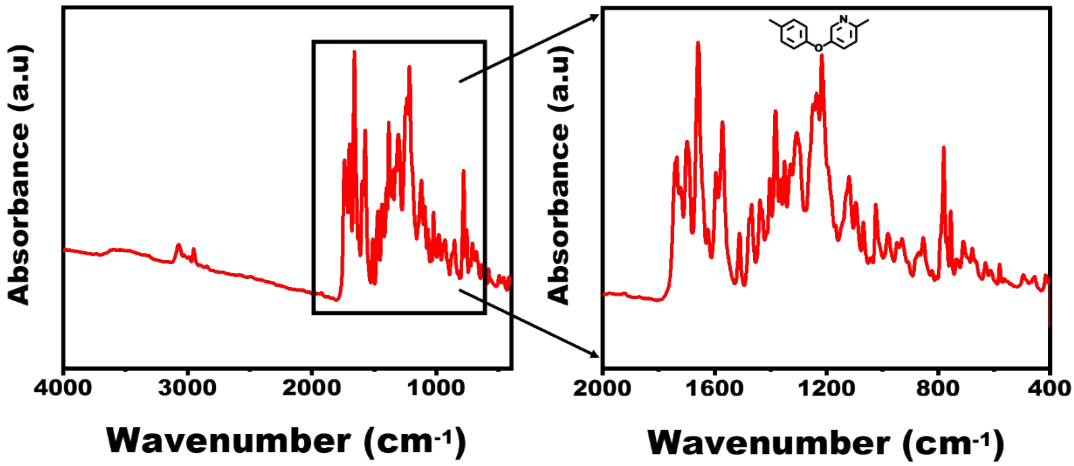

Figure S1. FT-IR spectra of MP-NI.

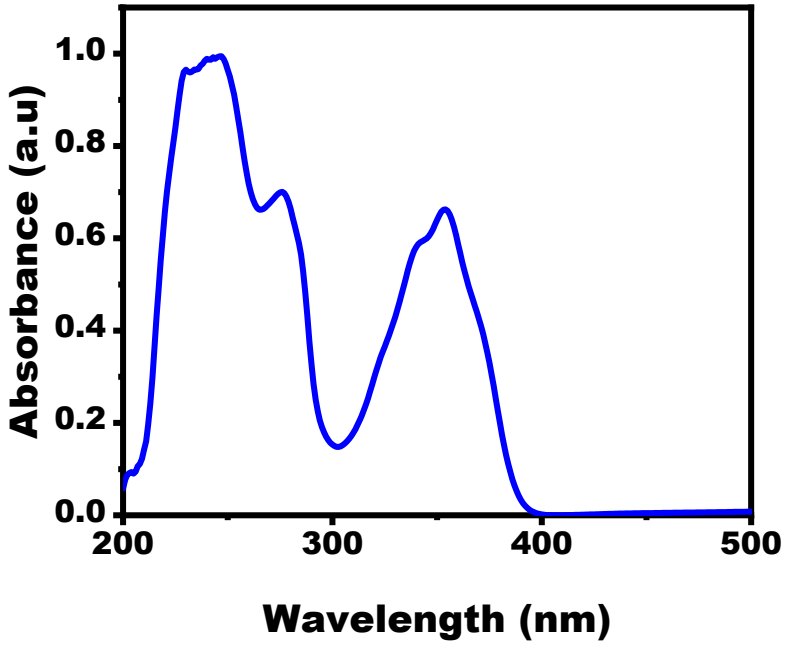

Figure S2. UV-Vis spectrum of MP-NI (0.1 mg/ml in THF).

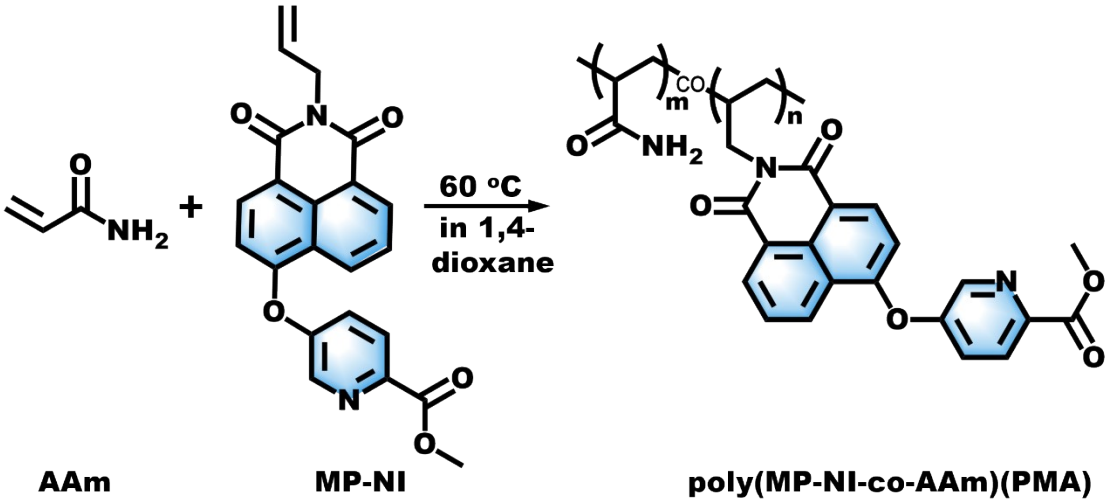

Figure S3. Synthetic procedure of the linear AIE-active PMA polymer.

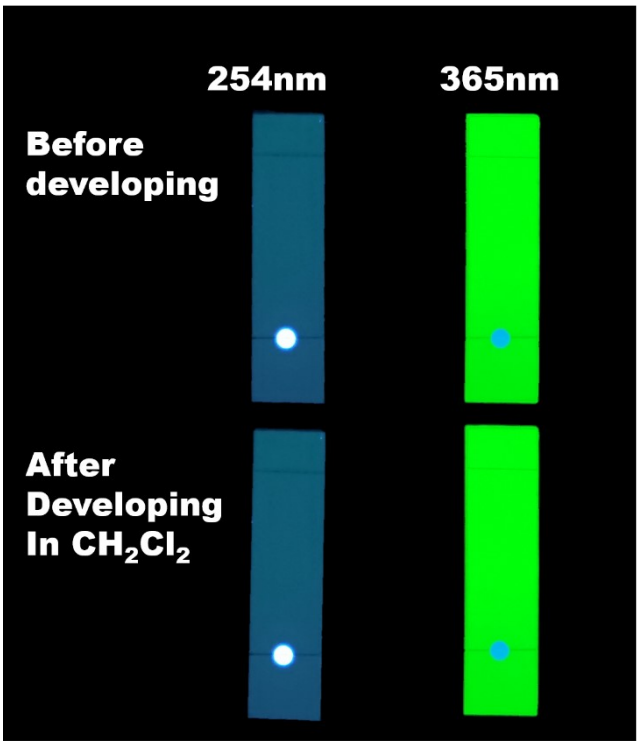

Figure S4. TLC analysis results of the purified PMA polymer by using CH_2Cl_2 as the eluents. CH_2Cl_2 is a good solvent for MP-NI, but poor solvent for the PMA polymer. These TLC results indicated there was no MP-NI residue in the purified PMA polymer.

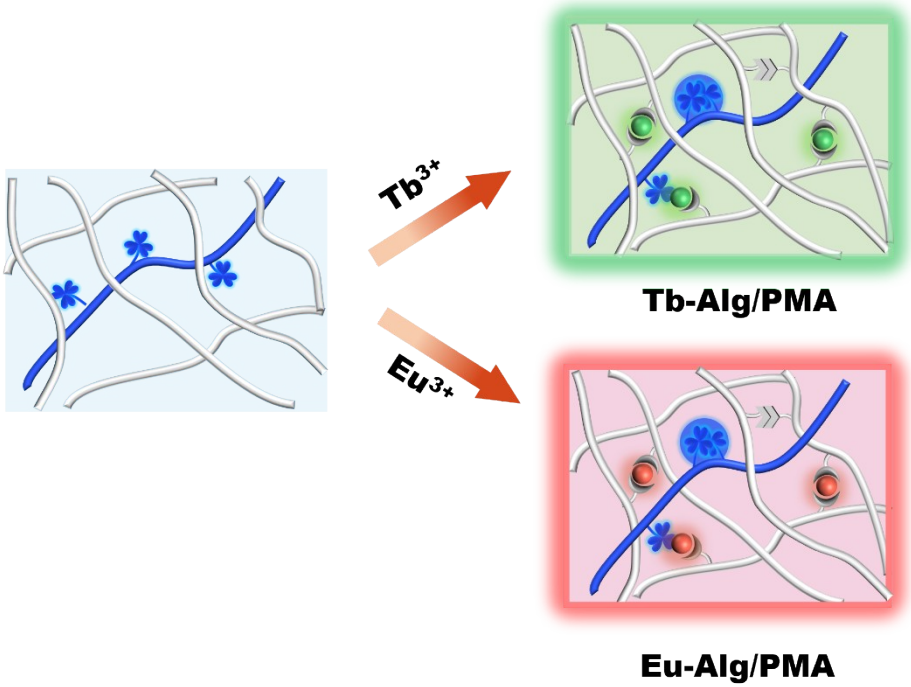

Figure S5. Scheme showing the preparation of dually cross-linked Tb-Alg/PMA and Eu-Alg/PMA hydrogels with lanthanide coordination and hydrogen bonding crosslinks.

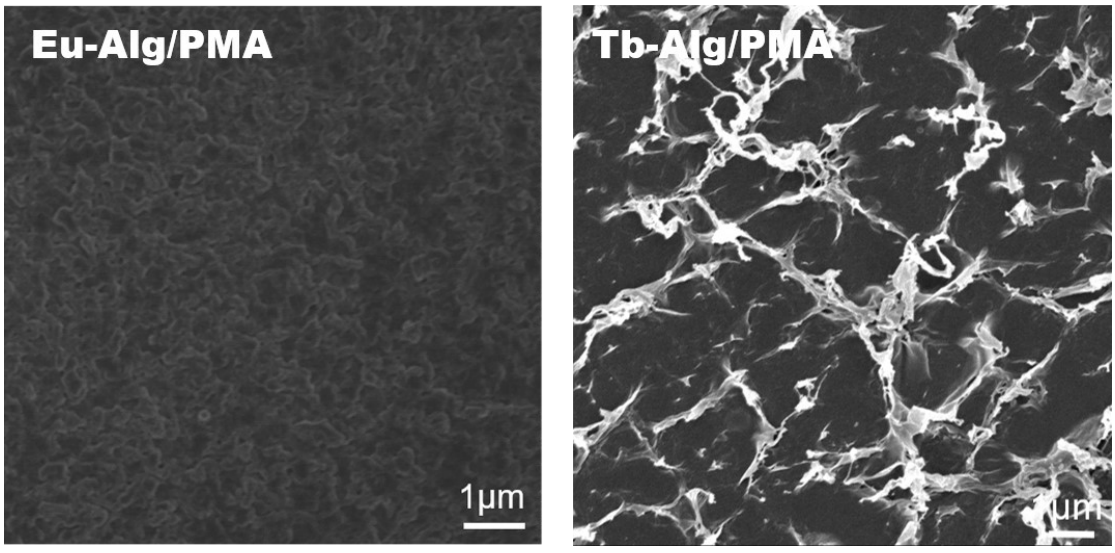

Figure S6. SEM images of the freeze-dried Eu-Alg/PMA and Tb-Alg/PMA hydrogels.

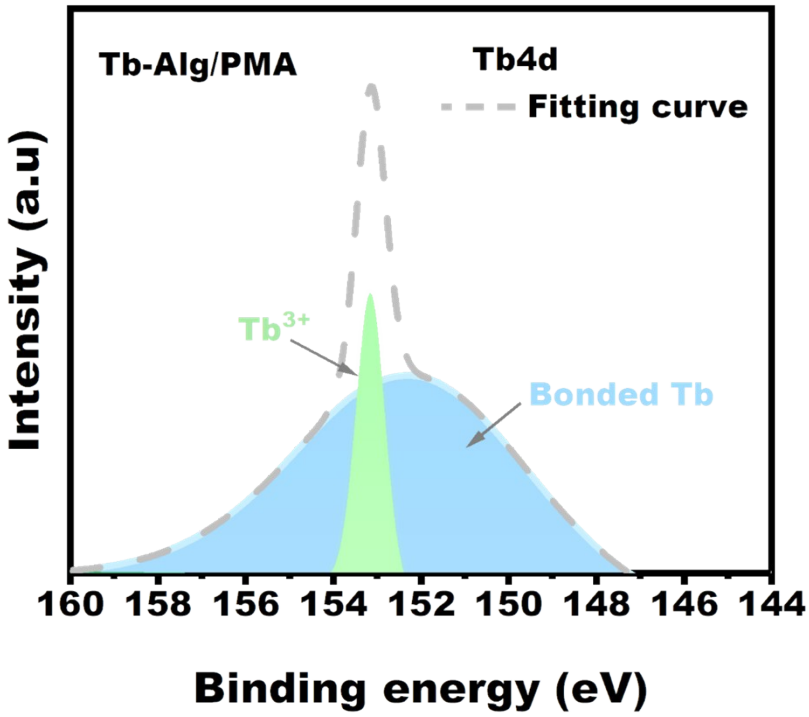

Figure S7. High-resolution XPS fitting results for Tb4d of Tb-Alg/PMA hydrogel sample.

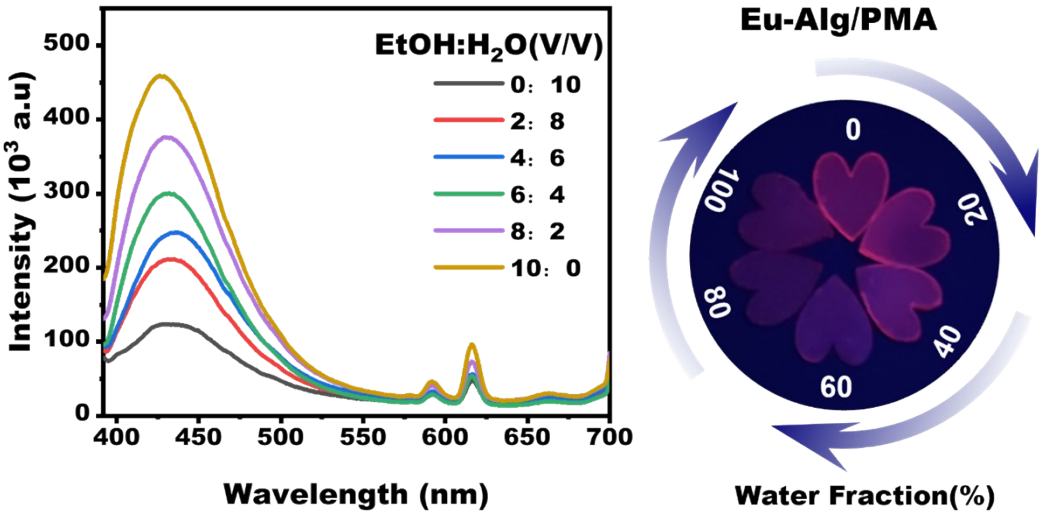

Figure S8. The recorded fluorescence spectra of the Eu-Alg/PMA gel samples that were prepared by treating the as-prepared Eu-Alg/PMA hydrogels in mixed EtOH/H_2O for solvent exchange, and their corresponding photos taken under 365 nm UV light.

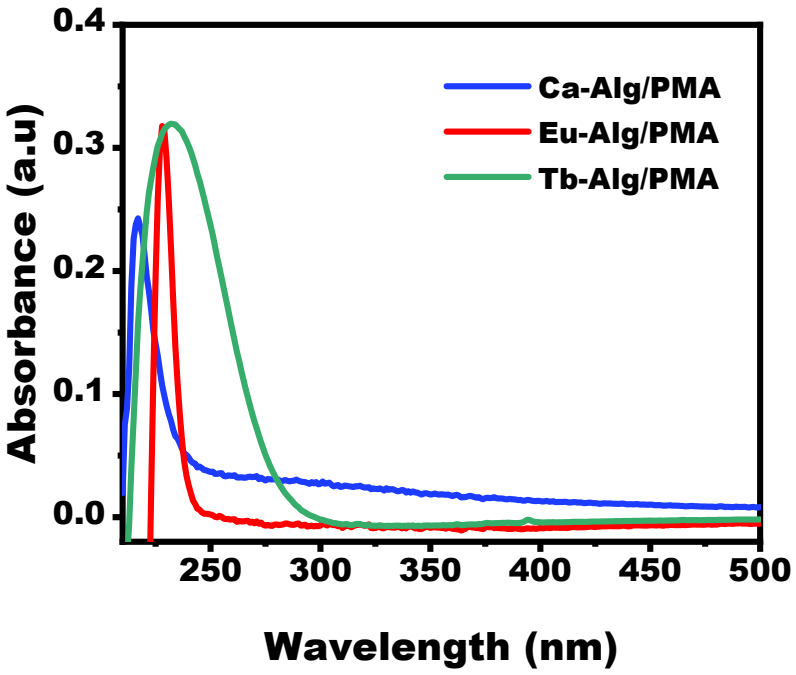

Figure S9 UV-Vis spectra Eu-Alg/PMA, Tb-Alg/PMA and Ca-Alg/PMA hydrogels.

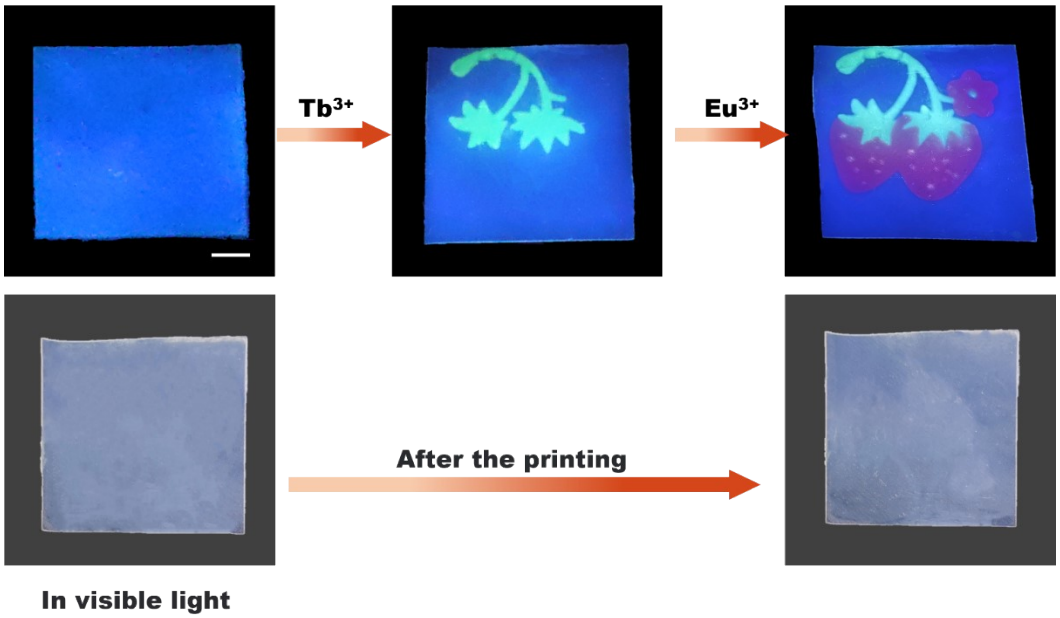

Figure S10. Fabrication of multicolor fluorescent patterns on the Ca-Alg/PMA hydrogel sheet by using Tb^{3+} and Eu^{3+} ions as the inks. In the bottom two photos taken under daylight, no patterns were observed, suggesting their potential uses for information encryption.

References

1. Li, P.; Zhang, D.; Zhang, Y.; Lu, W.; Zhang, J.; Wang, W.; He, Q.; Theato, P.; Chen, T., Aggregation-Caused Quenching-Type Naphthalimide Fluorophores Grafted and Ionized in a 3D Polymeric Hydrogel Network for Highly Fluorescent and Locally Tunable Emission. *ACS Macro Lett.* 2019, **8**, 937-942.