

## Supporting Information

# An Efficient Supramolecular Adsorbent for Co-adsorption of Dyes and metal ions from wastewater and its application in self-healing material

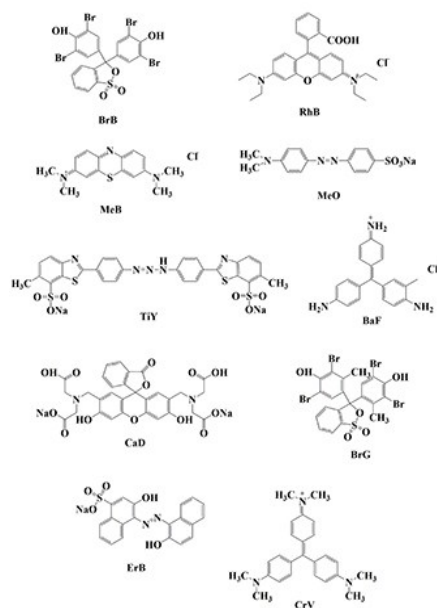
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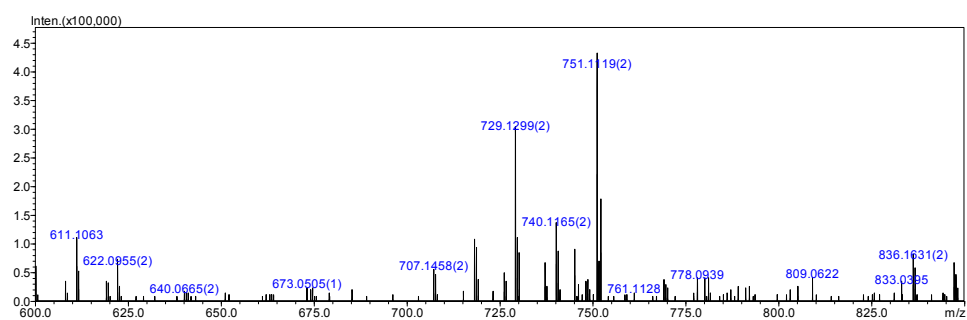
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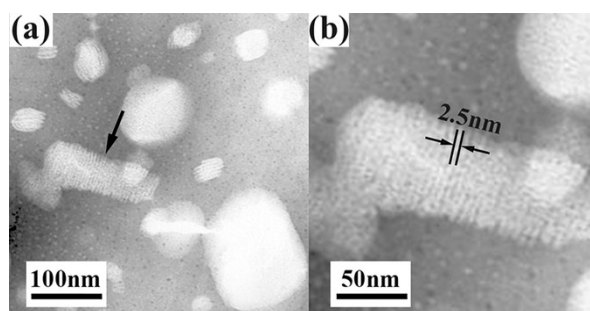
E-mail: yanliwei@swpu.edu.cn



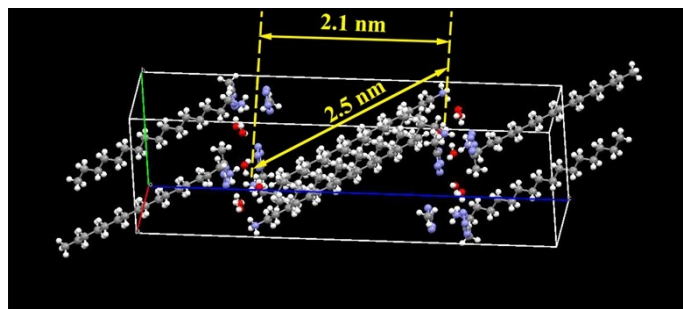
**Fig. S1** The molecular structure of dyes



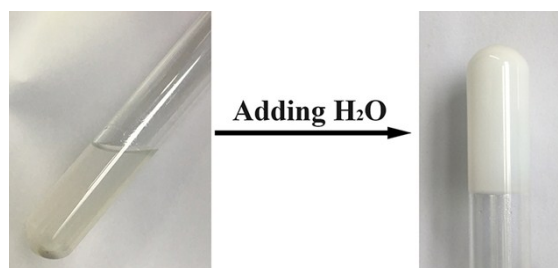
**Fig. S2** The ESI-TOF MS spectra of 2-OA complexation at a 1:2 ratio. m/z found: 751.1119; calculated: 751.6928.



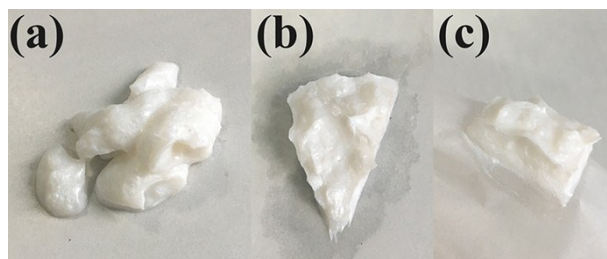
**Fig. S3** The TEM image of 1-OA in water on a carbon coated copper grid stained with phosphotungstic acid aqueous solution ( $10 \text{ g dm}^{-3}$ ).<sup>S1</sup>



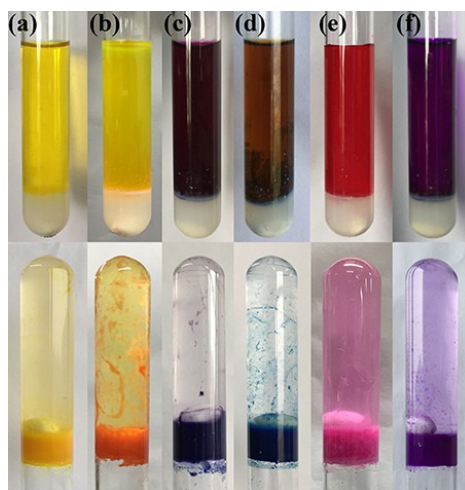
**Fig. S4** The length of the extended gelator molecule 1-OA was measured 2.1 nm in the crystal by MERCURY.<sup>S1</sup>



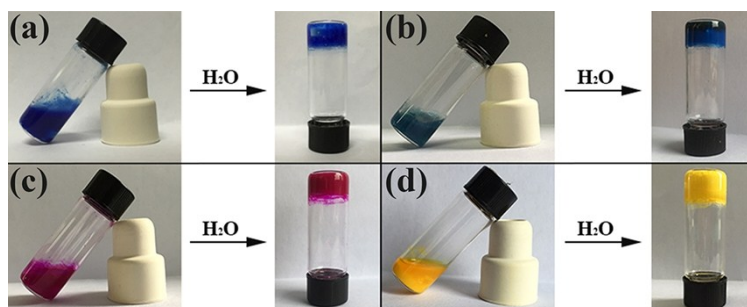
**Fig. S5** Stable opaque gel formed when adding few drops of water into a cyclohexane suspension of 2-OA.



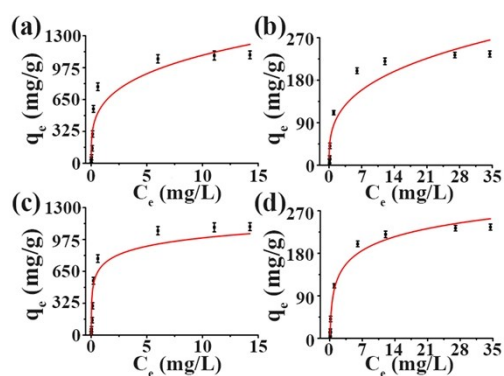
**Fig. S6** 2-OA gel without self-healing and moulding ability.



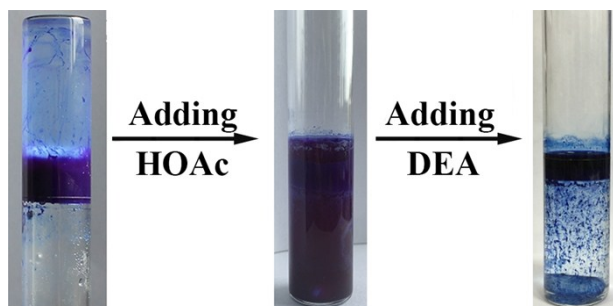
**Fig. S7** The biphasic mixture of cyclohexane (top) and dye solutions (bottom), and the pictures of respective dye-adsorbed gels: (a) TiY; (b) CaD; (c) ErB; (d) BrG; (e) BaF; (f) CrV.



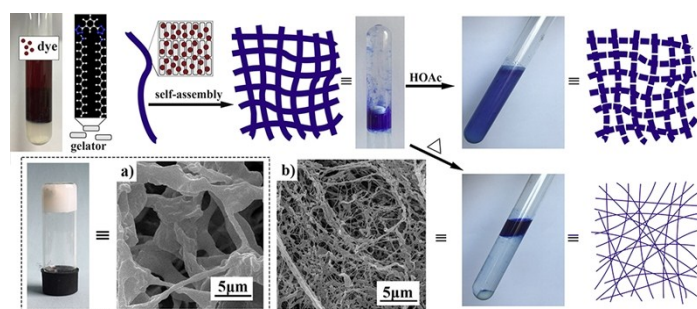
**Fig. S8** The cyclohexane suspension of the mixture of gelator and dyes, (a) BrB, (b) MeB, (c) RhB, and (d) MeO, stable gels were formed upon addition of a few drops of water via heating-cooling methods.



**Fig. S9** Adsorption isotherm curves of (a, c)  $\text{Cu}^{2+}$  and (b, d)  $\text{Fe}^{2+}$ : (a, b) Freundlich model and (c, d) Temkin model.



**Fig. S10** The desorption and re-adsorption of BrB under pH stimuli



**Fig. S11** The schematic adsorption and desorption of gelator **2-OA** for dyes.

**Table. S1** Adsorption isotherm parameters for the uptake of metal ions by **2-OA**.

| Adsorption isotherm | Parameter | Cu <sup>2+</sup>  | Fe <sup>2+</sup> |
|---------------------|-----------|-------------------|------------------|
|                     |           | $q_m(\text{exp})$ | 1105.4           |
| Langmuir            | $q_m$     | 1133.216          | 244.484          |
|                     | $K_l$     | 3.119             | 0.766            |
|                     | $R^2$     | 0.983             | 0.994            |
|                     | $R_L$     | 0.0113-0.632      | 0.00969-0.661    |
| Freundlich          | $K_2$     | 590.960           | 85.373           |
|                     | $n$       | 0.270             | 0.320            |
|                     | $R^2$     | 0.879             | 0.889            |
| Temkin              | $K_3$     | 335.399           | 11.895           |
|                     | $B$       | 122.061           | 42.083           |
|                     | $R^2$     | 0.925             | 0.986            |

**Reference:**

(S1) L. Yan, S. Gou, Z. Ye, S. Zhang, L. Ma, *Chem. Commun.* **2014**, 50, 12847-12850.