Supporting information

Supramolecular Hydrogels of α-cyclodextrin/Reverse poloxamines/Carbon-based Nanomaterials and Its Multi-functional Application

Jinglin Shen [a], Guiying Xu [a, b], Xia Xin [a, b *], Lin Wang [a], Zhaohua Song [a], Han Zhang [a], Lu Tong [a], Zewen Yang [a]

[a] *Key Laboratory of Colloid and Interface Chemistry (Shandong University), Ministry of Education, Shanda nanlu No. 27, Jinan, 250100, P. R. China*

[b] *National Engineering Technology Research Center for Colloidal Materials, Shandong University, Shanda nanlu No. 27, Jinan, 250100, P. R. China*

[*] Author to whom correspondence should be addressed, E-mail: xinx@sdu.edu.cn.

Phone: +86-531-88363597. Fax: +86-531-88361008

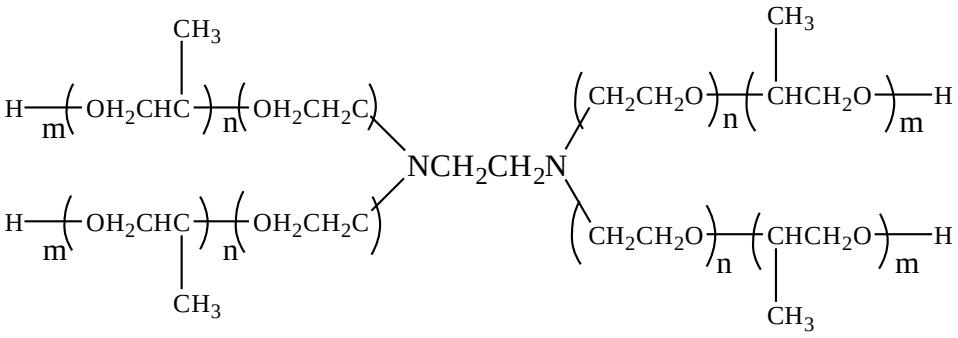


Figure S1 The chemical structure of T90R4 (Mw=7200 g mol^{-1}, n=18, m=16)

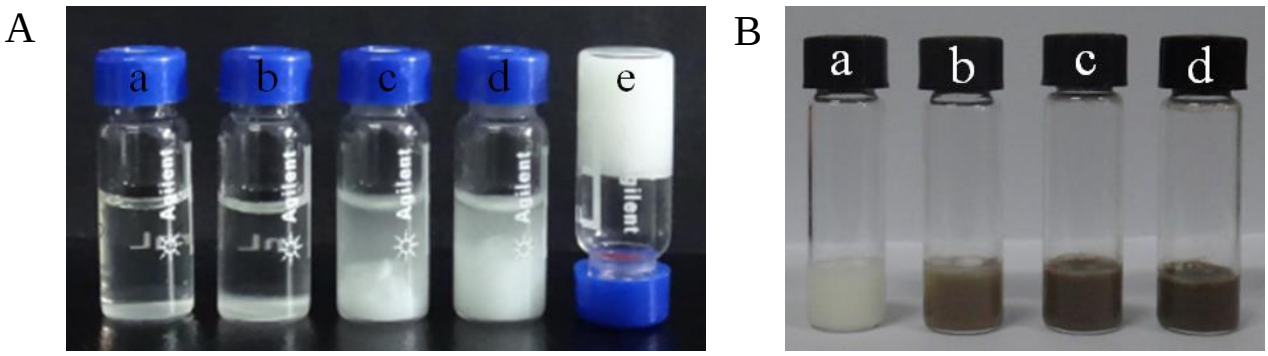


Figure S2 (A) Photographs of five typical samples: 50 mg mL^{-1} T90R4 with varied α-CD concentrations: (a) 60, (b) 80, (c) 100, (d) 120, (e) 150 mg mL^{-1}, respectively. The photos were taken after the samples were stored at 20.0 ± 0.1ºC for two weeks. (B) photographs of samples with the concentration of 150mg mL^{-1} α-CD，50 mg mL^{-1} T90R4, (a) 0 mg mL^{-1} GO, (b) 1 mg mL^{-1} GO, (c) 3 mg mL^{-1} GO, (d) 5 mg mL^{-1} GO.

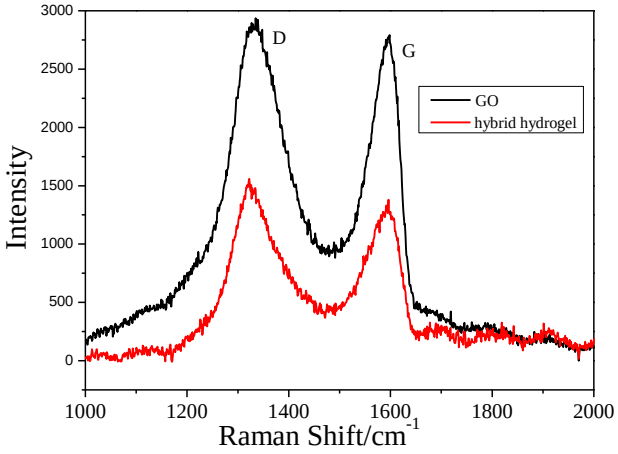


Figure S3 Raman spectra excited at 633 nm of water-dispersed 5mg mL^{-1} GO and hybrid hydrogel.

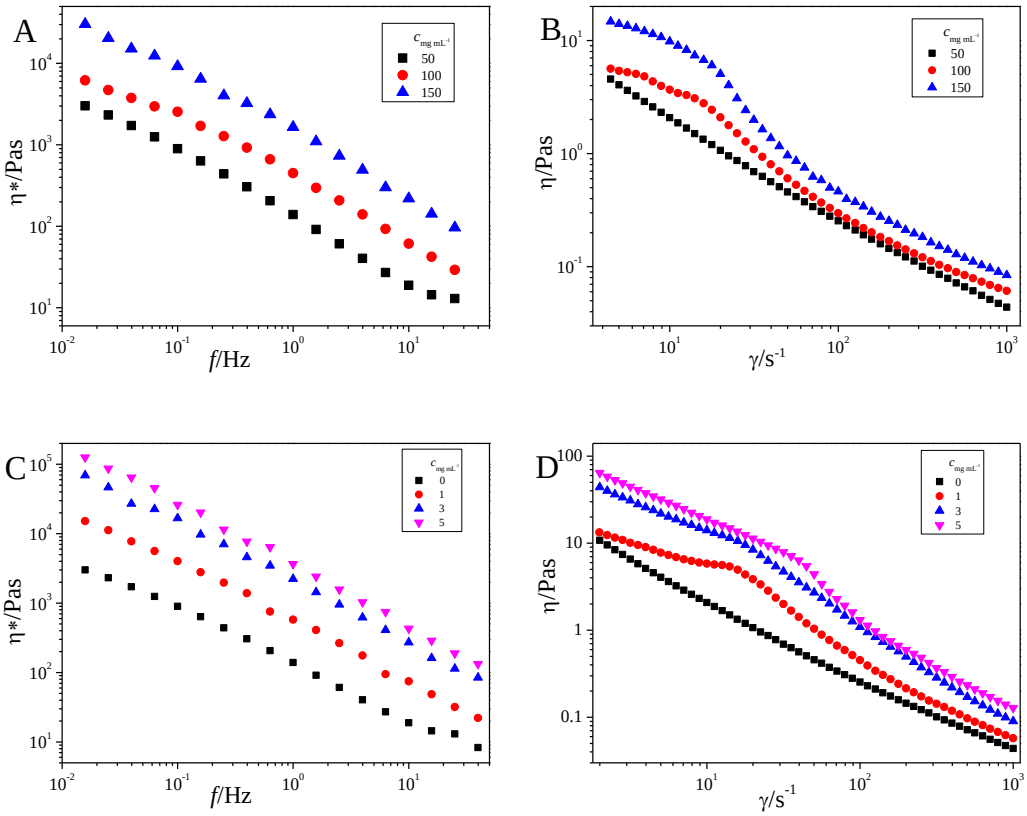
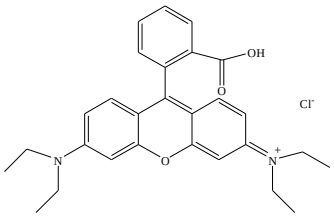
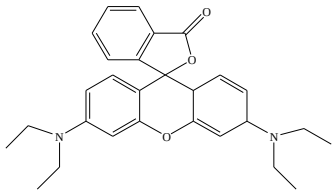


Figure S4 Rheological results of hydrogel with different concentration of T90R4 and fixed concentration of α-CD at 100mg mL^{-1}: (A) variation of η* as a function of frequency and (B) variation of shear viscosity as a function of shear rate. Rheological results of hydrogel with different concentration of GO at fixed concentration of α-CD, T90R4 of 100 mg mL^{-1}, 50 mg mL^{-1}, respectively: (C) variation of η* as a function of frequency and (D) variation of shear viscosity as a

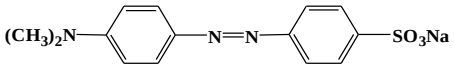
function of shear rate.



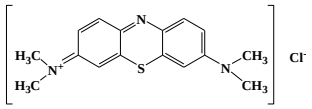
rhodamine B (1)



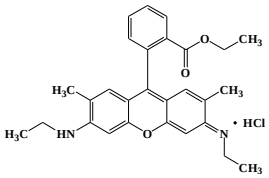
rhodamine B (2)



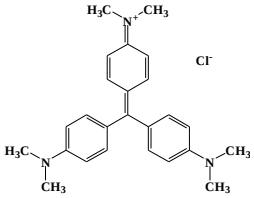
methyl orange (MO)



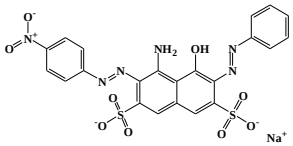
methylene blue (MB)



rhodamine 6G (R6G)

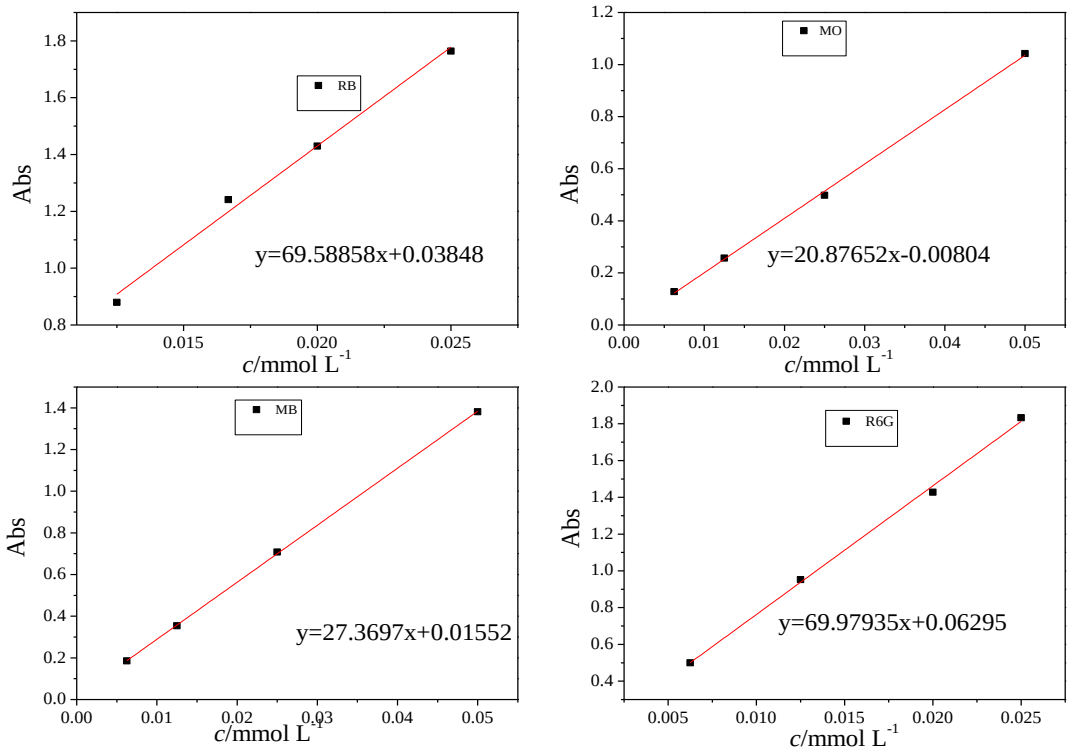


mehtyl violet (MV)



amino black 10B (AB10B)

Figure S5 Structures of dyes.



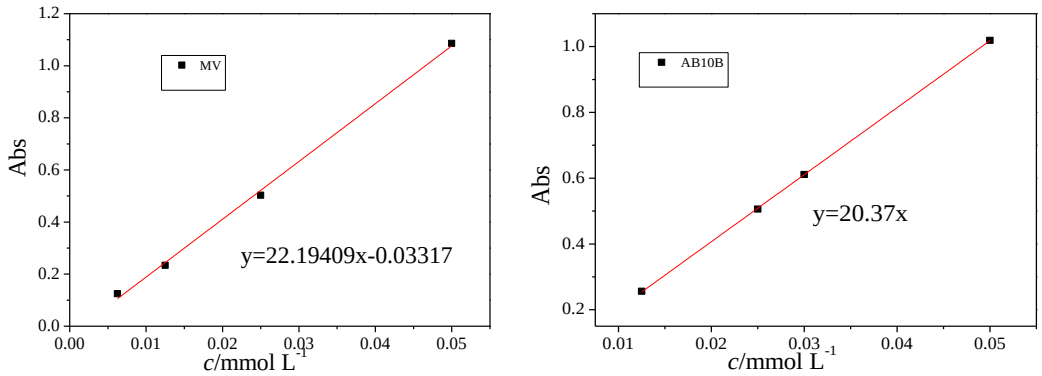
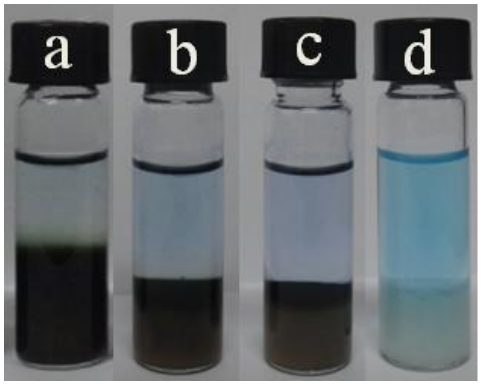


Figure S6 Standard curve of dyes at λ_{max}

A



B

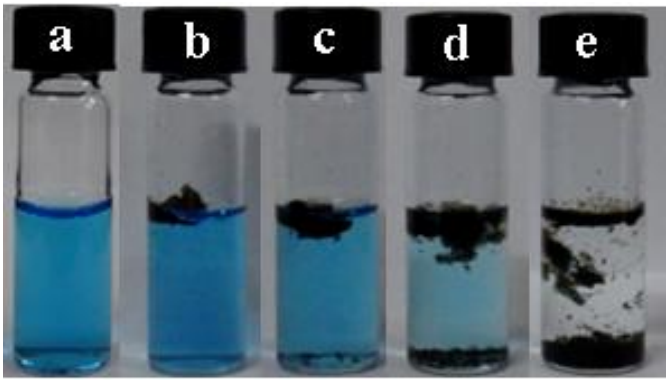


Figure S7 (A) A final state of hydrogel containing (a) 5, (b) 3, (c) 1, (d) 0 mg mL^{-1} GO after fully adsorption of MB. (B)The dye of MB solution and the freeze-dried samples of 5 mg mL^{-1} GO before and after adsorption: (a) 0.05 mmol L^{-1} MB; (b) 0 min; (c) 60 min; (d) 120 min; (e) 240 min.

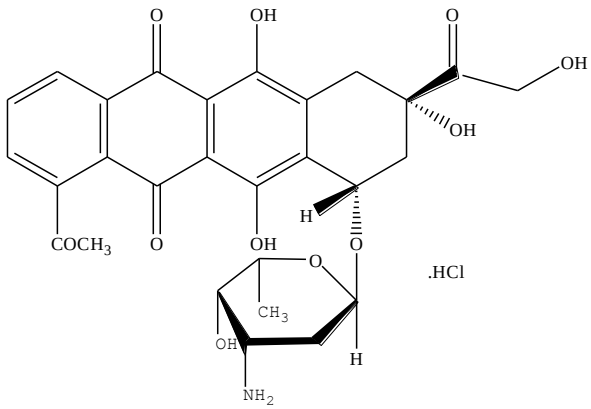


Figure S8. Structure of DOX

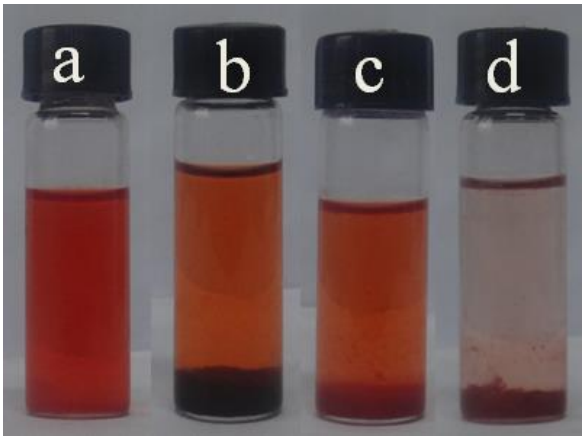


Figure S9 Photographs of samples completely release of DOX after 50 h. (a) α-CD，T90R4 of 100 mg mL^{-1}, 25 mg mL^{-1} at pH=2, (b) α-CD，T90R4 of 100 mg mL-1, 25 mg mL^{-1} and containing 0.5 mg mL^{-1} GO at pH=2, (c) α-CD，T90R4 of 100mg mL^{-1}, 25 mg mL^{-1} at pH=5. (d) α-CD，T90R4 of 100 mg mL^{-1}, 25 mg mL^{-1} at pH=7.4.