

The Supporting Information

Direct syntheses of cucurbit[7]uril-anchored polyacrylic acid microspheres and adsorption some of basic dyes by the derivative

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Characterization: All NMR spectra, including those for titration experiments, were recorded at 20°C on a VARIAN INOVA-400 spectrometer. D₂O was used as a field-frequency lock, and the observed chemical shifts are reported in parts per million (ppm) relative to DHO at 4.67 ppm.

Fourier transform infrared (FTIR) spectra were acquired on a VERTEX 70 FTIR spectrometer from samples in KBr pellets. The spectra were acquired over the frequency range 4000 – 400 cm⁻¹ at a resolution of 4 cm⁻¹ from a total of 16 scans. The analyses were performed with approximately 10 mg portions of dried sample in a dynamic nitrogen atmosphere (flow rate 50 mL min⁻¹) at a heating rate of 10 °C min⁻¹. Transmission electron microscopy (TEM) images were recorded on a Hitachi JEM-2100 electron microscope operated at 200 kV. Samples were dispersed in solutions of 0.1 M sodium sulfate before being immobilized on copper grids. The samples were dried at room temperature. Scanning electron microscopy (SEM) images were recorded out on a Hitachi S-4800 II field-emission SEM. Samples were dispersed in acetone immobilized on silicon wafers, and allowed to dry under reduced pressure at 40°C for several hours.

Gel permeation chromatography (GPC) measurements were carried out in 0.3 M sodium nitrate solution eluent (pH 6.8, 1 mL/min) at 45°C using a PL-GPC50 from

Agilent with a refractive index detector. The reference solution was glucan ($M_w = 2.73 \times 10^6$) at the concentration of 6.75 mg mL^{-1} .

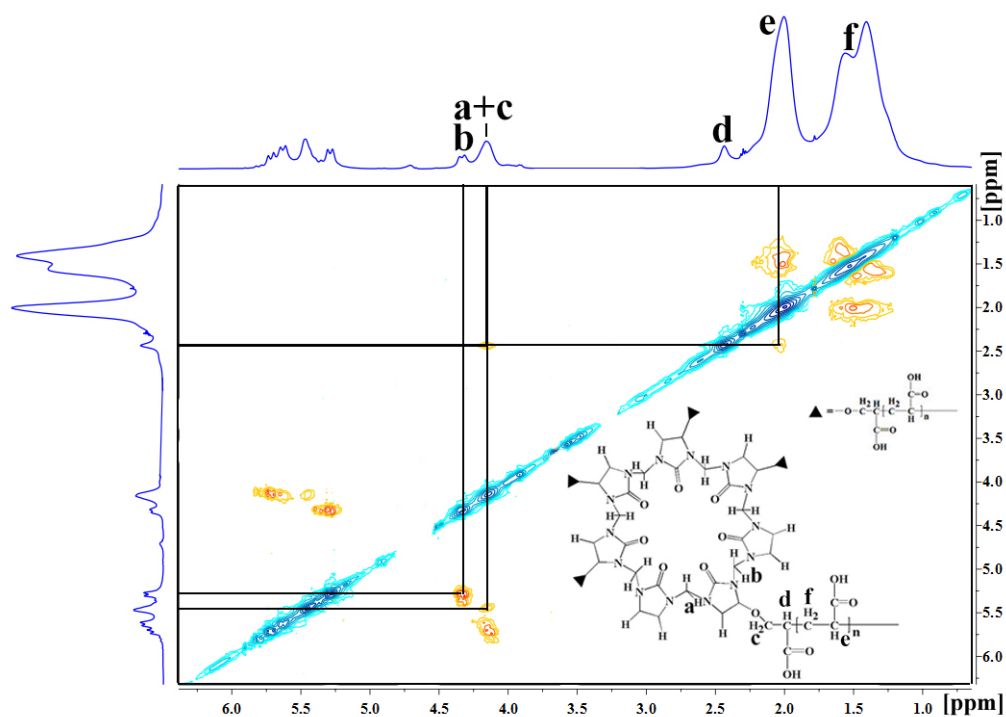


Figure S1 Roesy NMR spectrum of the Q[7]-PAA-3

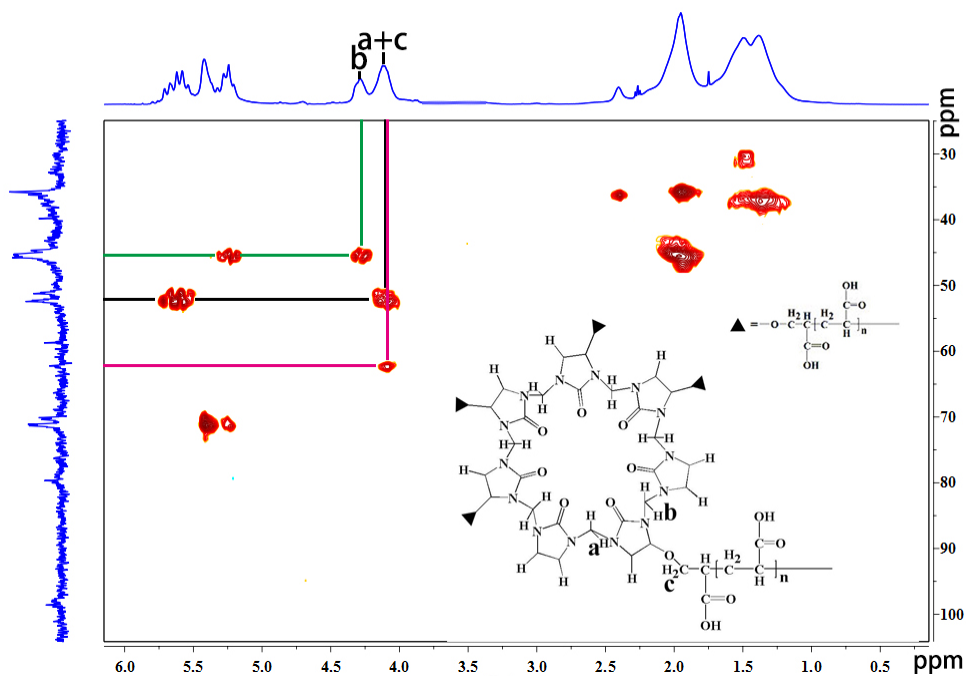


Figure S2 HMQC spectrum of the Q[7]-PAA-2

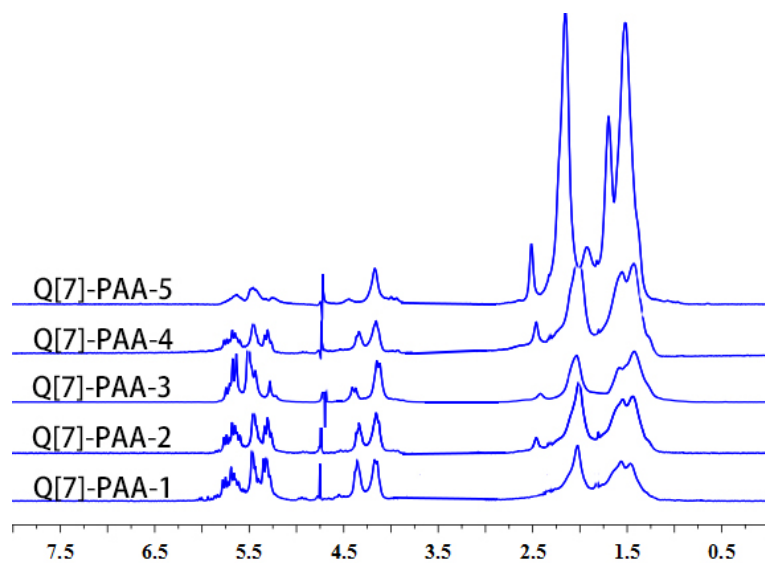


Figure S3 ^1H NMR spectra of four Q[7]-PAA samples in D_2O

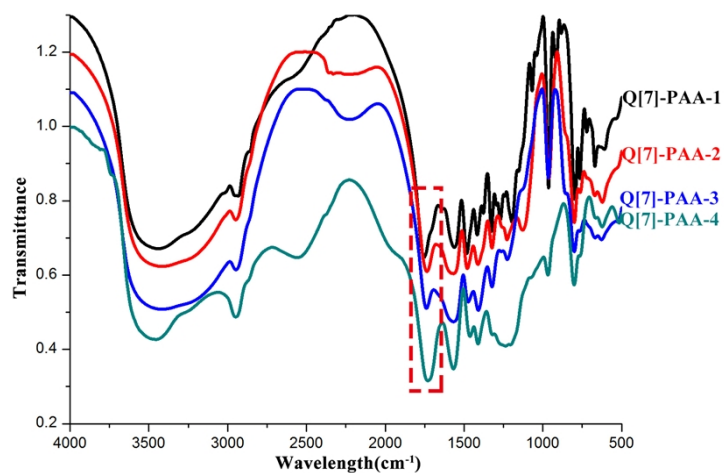


Figure S4 FTIR spectra of the Q[7]-PAA Samples

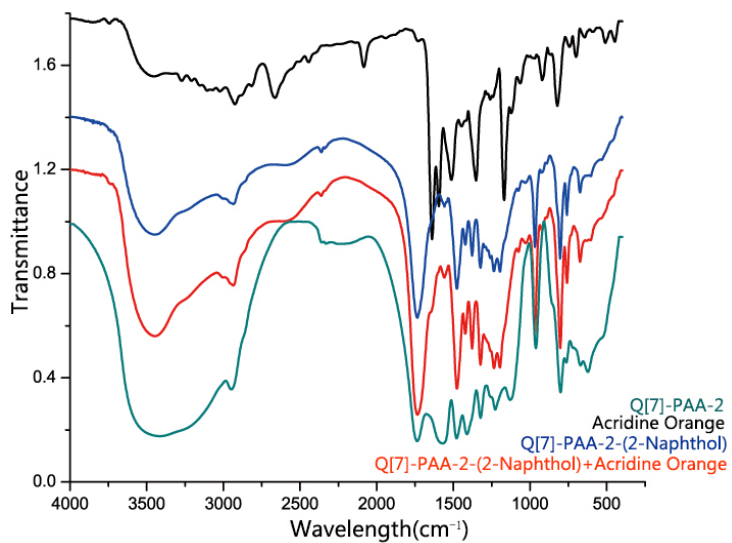


Figure S5 FTIR spectra of the Q[7]-PAA-2 Derivative and its adsorption product

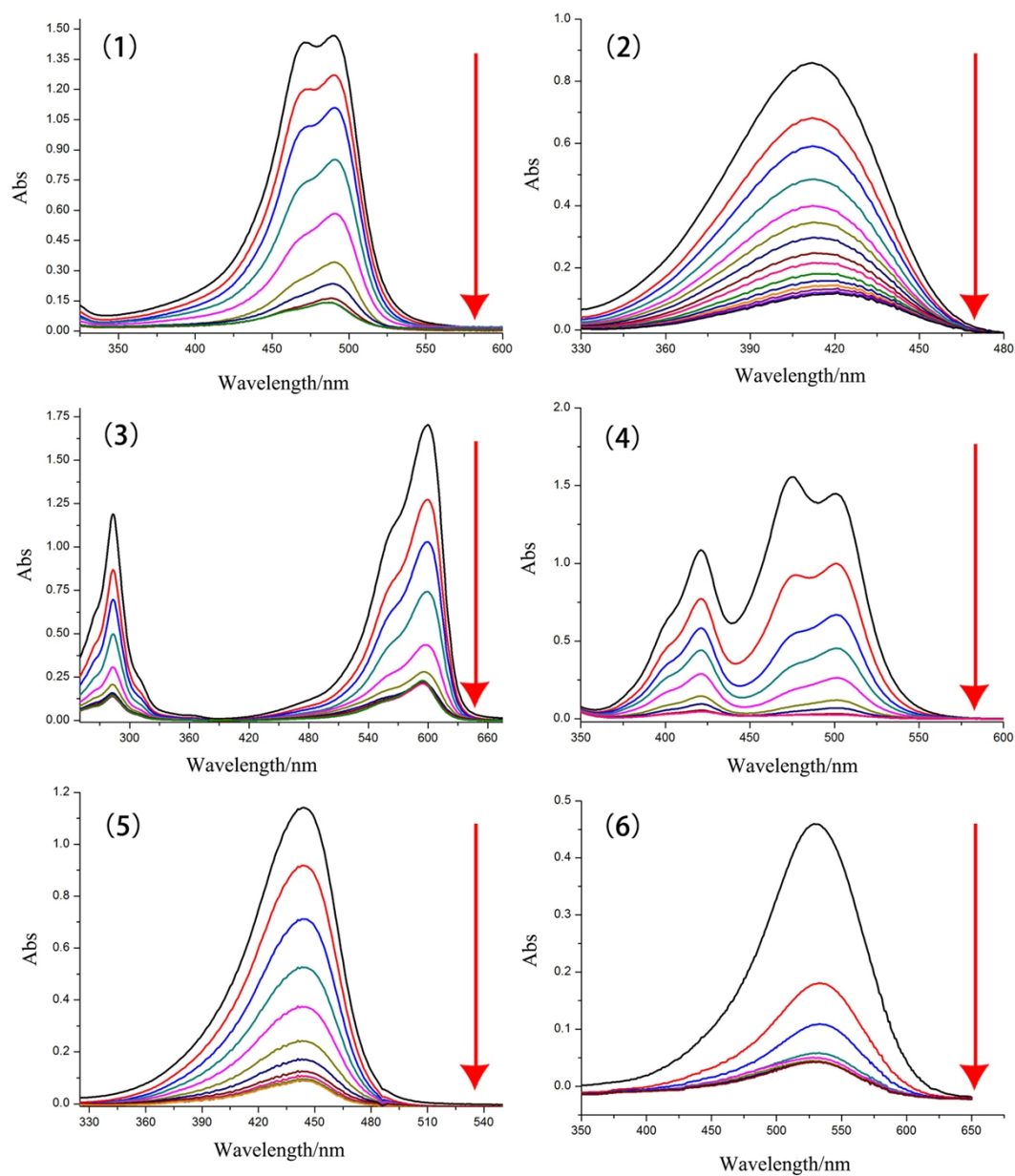


Figure S6 Profiles of UV-visible absorption spectra of (1) Acridine Orange, (2) Basic Yellow, (3) Thionine, (4) Thiazole Orange, (5) Proflavine, (6) Neutral Red with gradually addition of Q[7]-2-PAA-(2-Naphthol) in 1 mg portions.

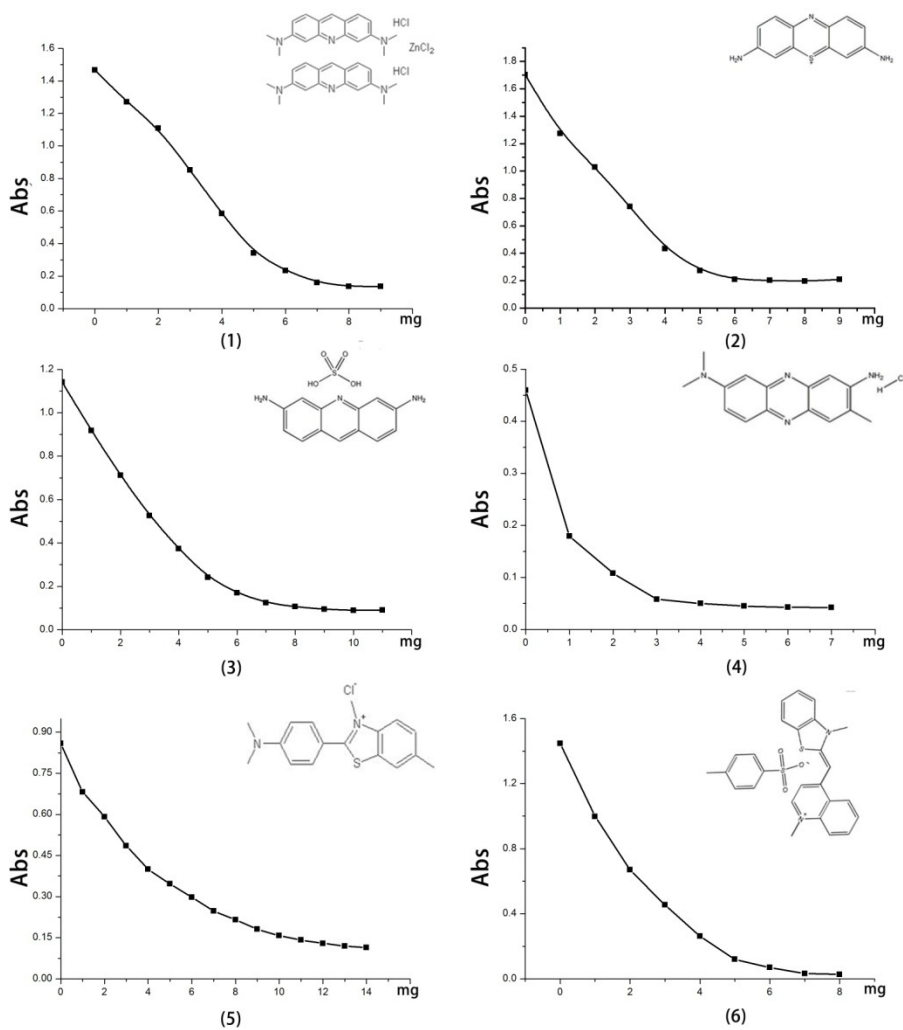


Figure S7 Profiles of UV Abs changes of (1) Acridine Orange, (2) Thionine, (3) Proflavine, (4) Neutral Red, (5) Basic Yellow, (6) Thiazole Orange at corresponding λ_{\max} with gradually addition of Q[7]-2-PAA-(2-Naphthol) in 1 mg portions.

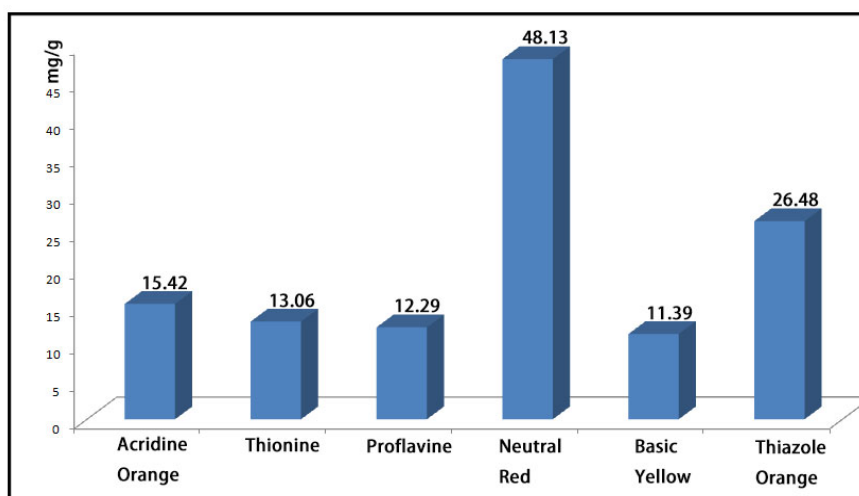


Figure S8 adsorption amount histogram of Q[7]-PAA-(2-Naphthol) for basic dyes.

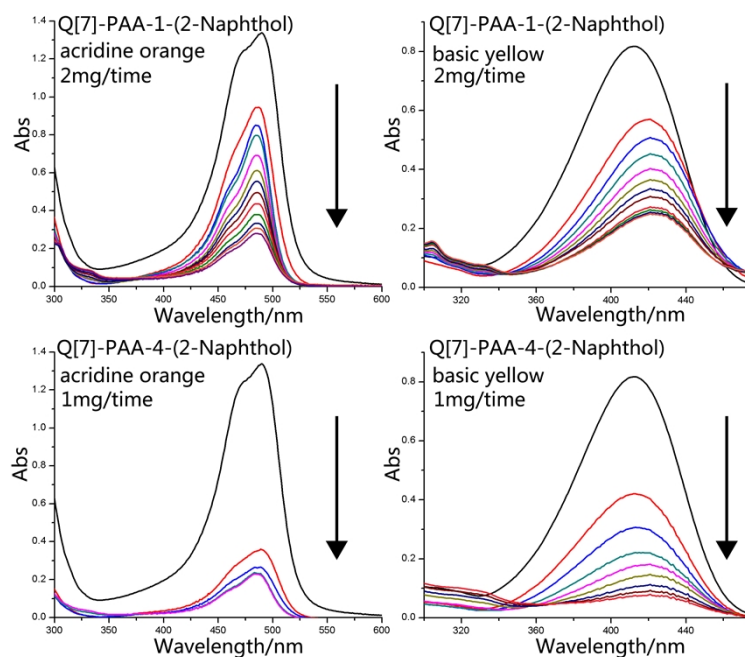


Figure S9 Profiles of UV-visible absorption spectra of (top) (1) Acridine Orange, (2) Basic Yellow, with gradually addition of (top) Q[7]-PAA-1-(2-Naphthol) and (bottom) Q[7]-PAA-4-(2-Naphthol) in 2 mg portions, respectively.

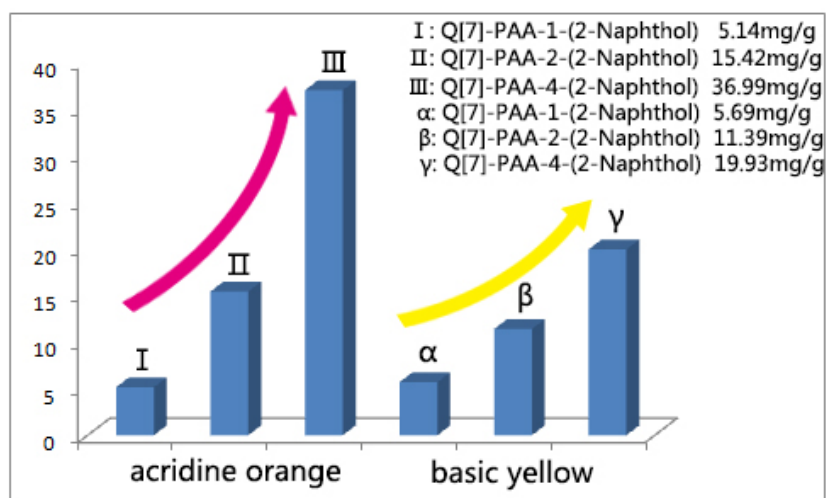


Figure S10 Adsorption amount histogram of polymer aggregates with different feed composition ratios (left) Acridine Orange, (right) Basic Yellow.