

Supporting information for

**A polymeric film probe with turn-on fluorescence response to hydrogen sulfate  
ion in aqueous media**

Wei Lu, Jinting Zhou, Keyuan Liu, Dan Chen, Liming Jiang<sup>\*</sup>, and Zhiqian Shen

MOE Key Laboratory of Macromolecular Synthesis and Functionalization;

Department of Polymer Science and Engineering,

Zhejiang University, Hangzhou 310027, China

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<sup>\*</sup> Correspondence to: L.M. Jiang (E-mail: cejlm@zju.edu.cn)

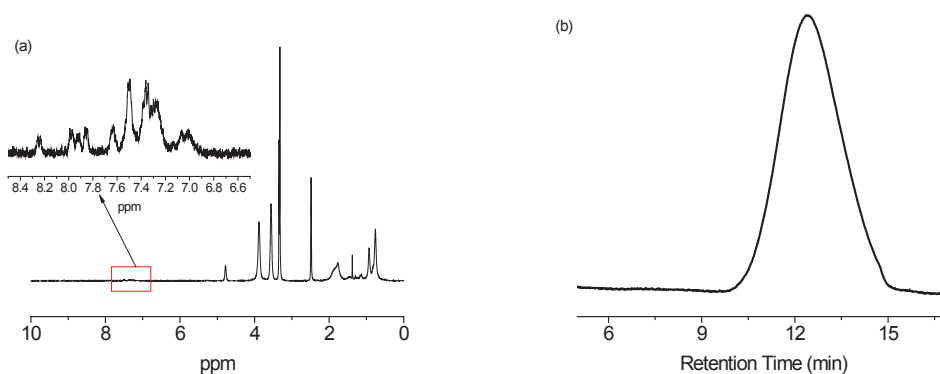


Figure S1. Poly(HEMA-*co*-VNP) with 0.98 mol% of VNP units (**P1**, in Table 1): (a)  $^1\text{H}$  NMR spectrum ( $\text{DMSO-}d_6$ ) and (b) a typical GPC trace (using DMF as the elution solvent).

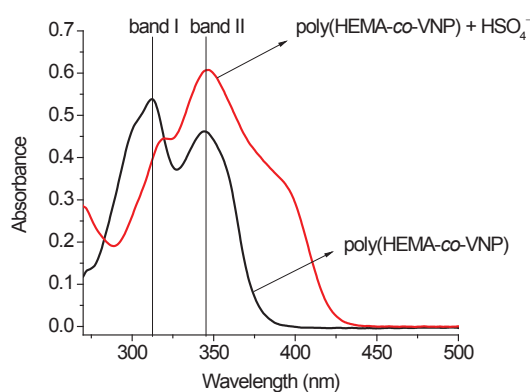


Figure S2. Changes in UV-vis spectra of **P1** ( $c = 1.6 \text{ mg/mL}$ ) upon addition of  $\text{TBA}^+\text{HSO}_4^-$  of  $\sim 30$  equiv in DMSO/THF (1:4,  $v/v$ ).

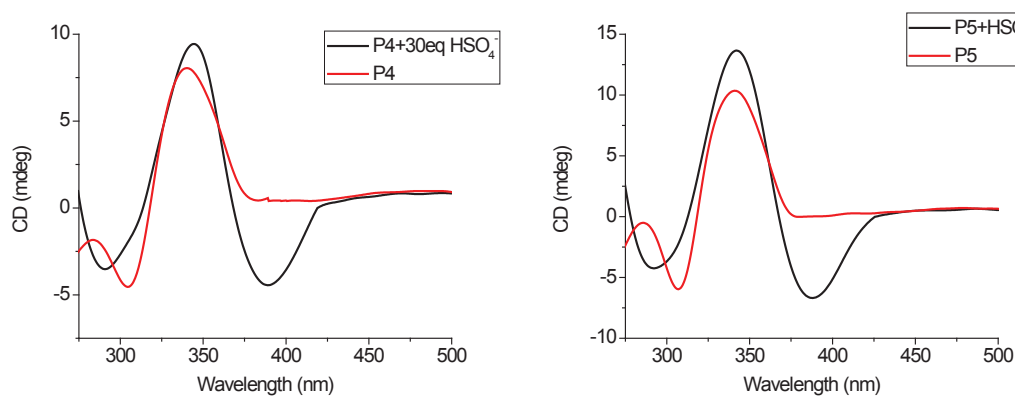


Figure S3. Changes in CD spectra of poly(HEMA-*co*-VNP)s upon addition of  $\text{TBA}^+\text{HSO}_4^-$  of  $\sim 30$  equiv in DMSO/THF (1:4,  $v/v$ ). **P4**: VNP = 7.5 mol%; **P5**: VNP = 12.0 mol%, see Table 1.

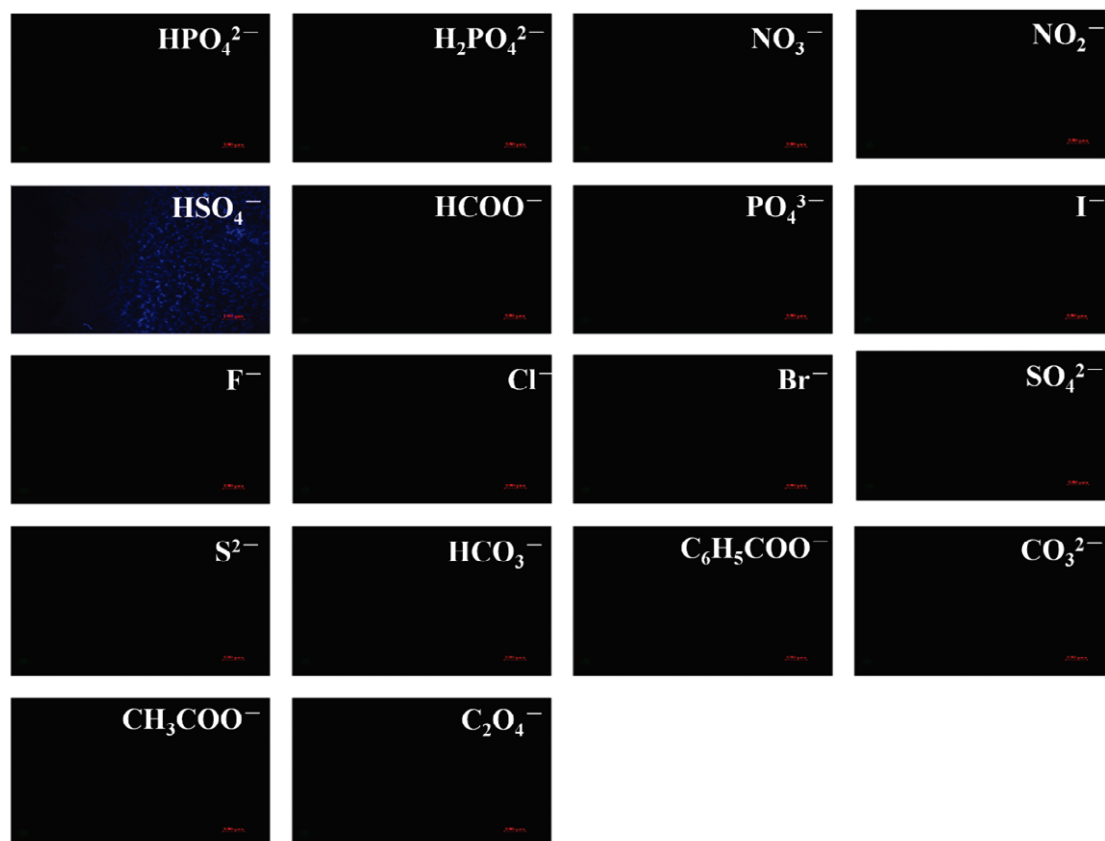


Figure S4. Fluorescence images of the film of **P1** after being immersed in the aqueous solution of different anions (in the form of  $\text{Na}^+$  salts) for  $\sim 3$  min.

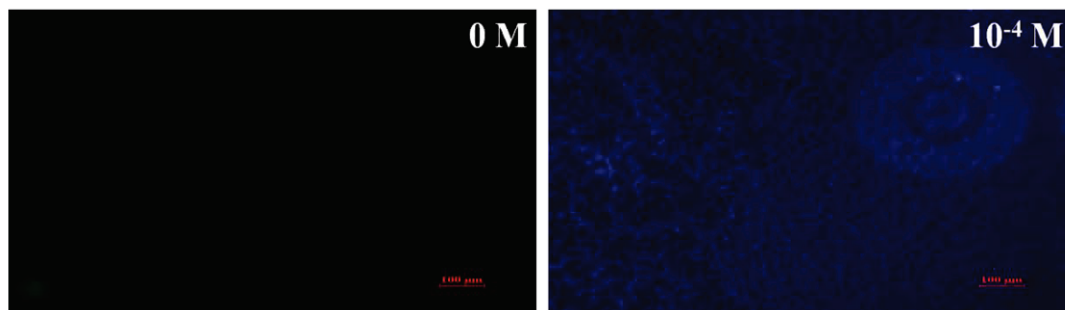


Figure S5. Fluorescence images of the film of **P1** after being immersed in the pure  $\text{CH}_2\text{Cl}_2$  (left) and the  $\text{CH}_2\text{Cl}_2$  solution of  $\text{TBA}^+\text{HSO}_4^-$  ( $2 \times 10^{-4} \text{M}$ , right).

### Fluorescent measurement

For the fluorescence measurement of the polymeric films, the front-face excitation and emission collection were adopted. The procedure is illustrated in Figure S5. First, the film was attached to a fixed bracket for making sure that the same point is measured before and after exposure to aqueous solution of  $\text{HSO}_4^-$ . Second, the film was treated with dry  $\text{N}_2$  flow for 3 minutes to remove most of water on the surface. Third, front-face fluorescence was recorded.

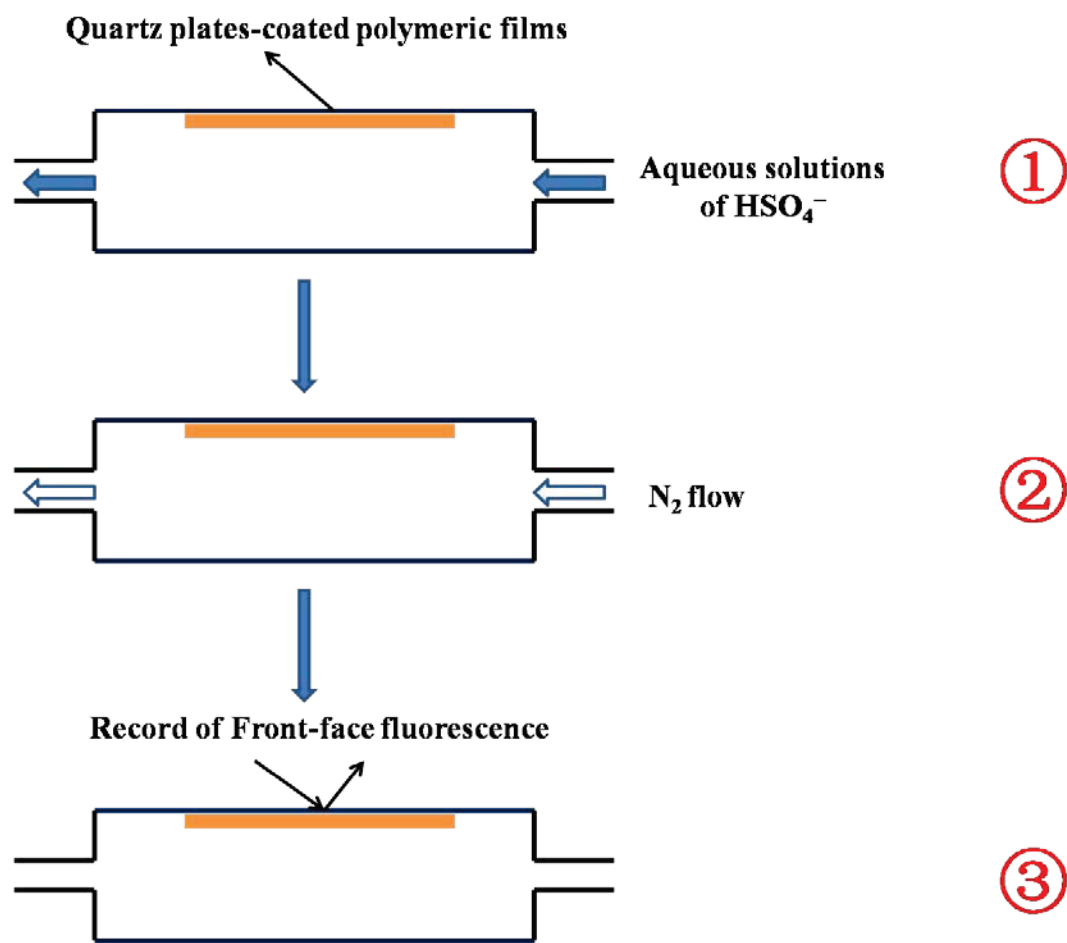


Figure S6. The scheme of the fluorescence measurement for the polymeric films.