

Supplementary Information

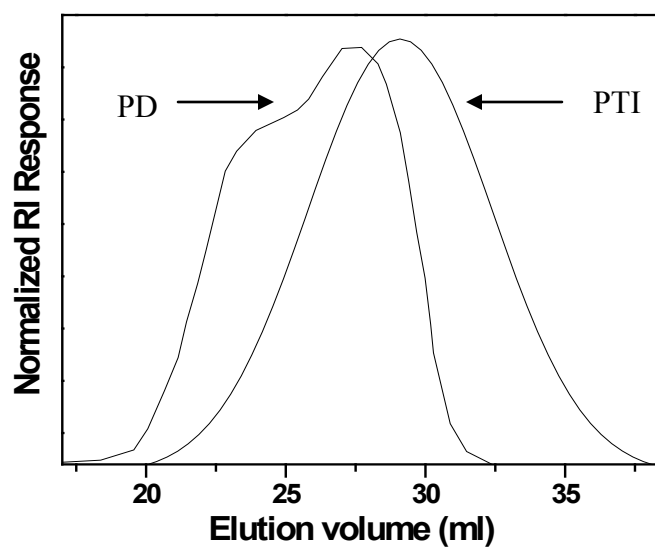
**Polythiophene-*g*-Poly(dimethylaminoethyl methacrylate) Doped Methyl
Cellulose Hydrogel Behaving like a Polymeric AND Logic Gate**

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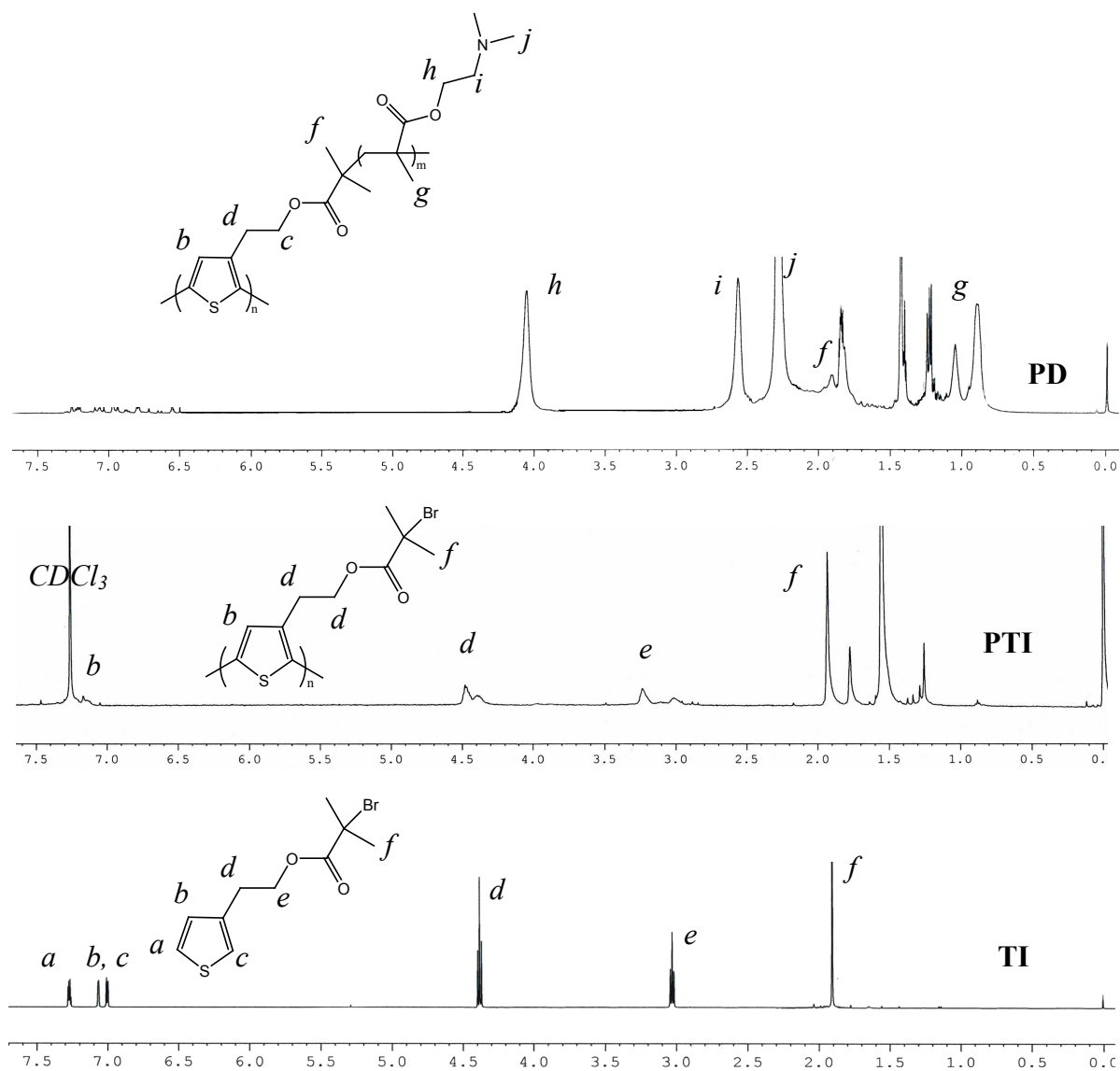
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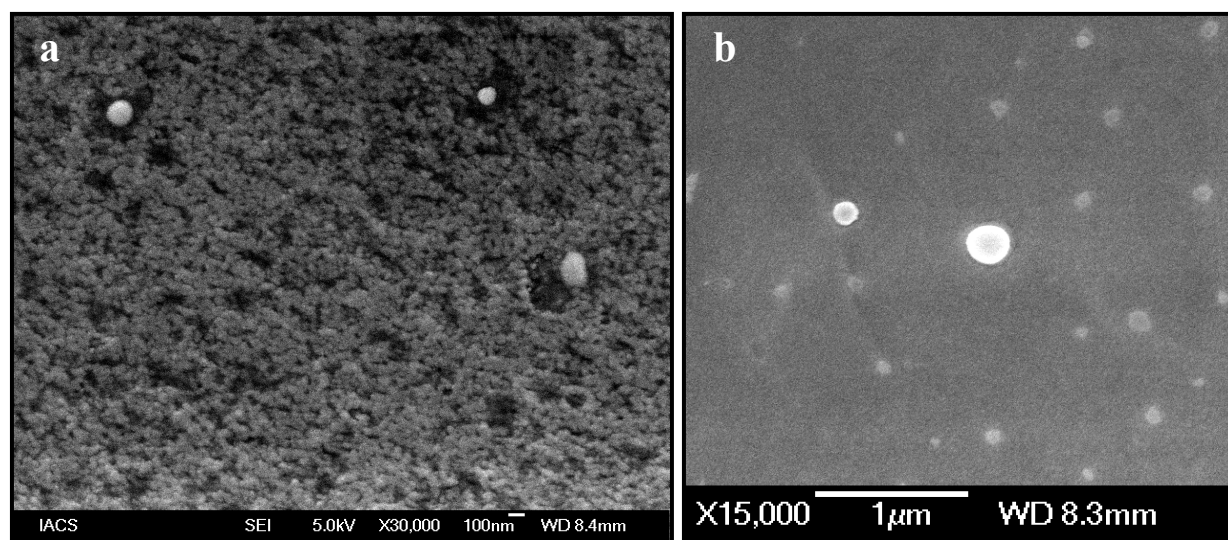
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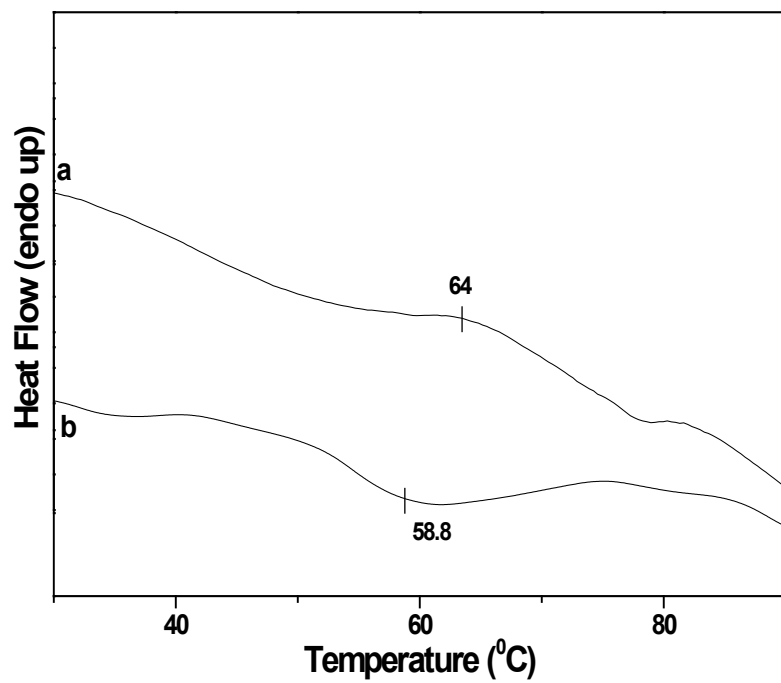
SI Fig. 1 GPC traces of PTI and PD polymers



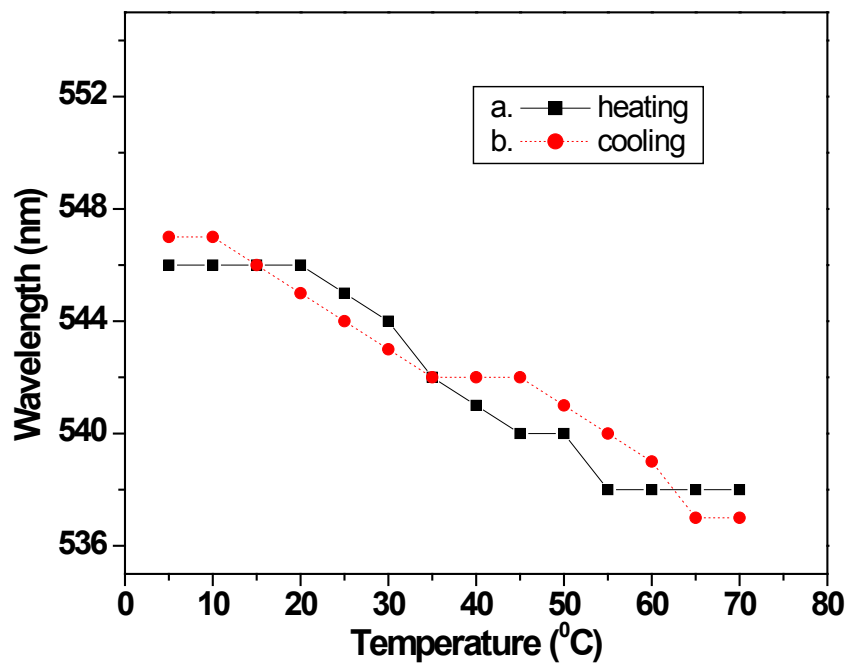
SI Fig. 2 ^1H NMR spectrum of TI, PTI and PD polymer in CDCl_3



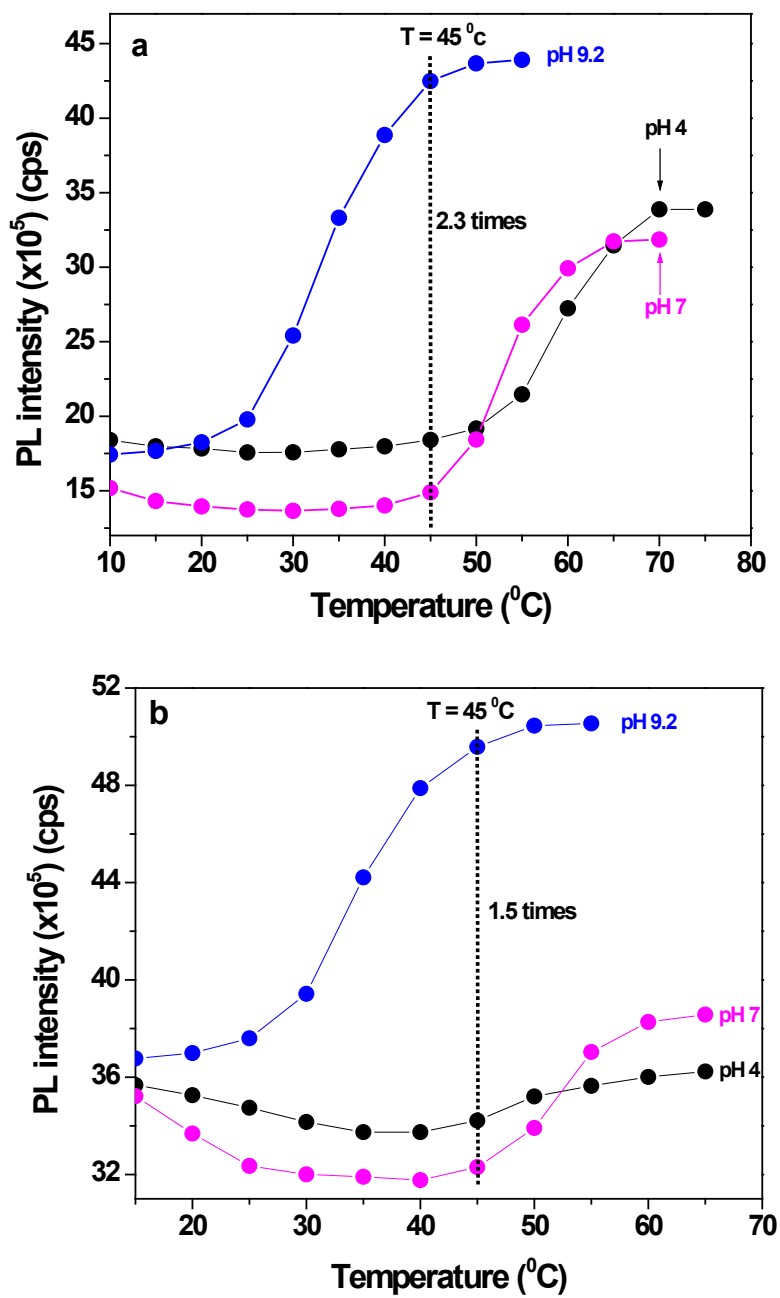
SI Fig. 3 (a) FESEM images of dried hydrogel of MC (2%, w/v) and (b) and that of dried PD solution (0.1%, w/v) at pH 7.



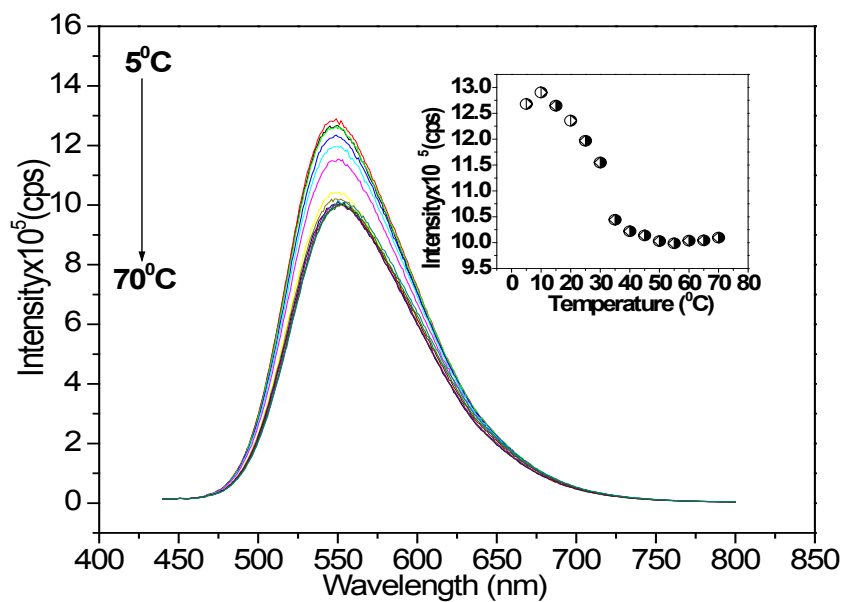
SI Fig. 4 DSC thermograms of PD solution (0.1%, w/v) (a) heating & (b) cooling



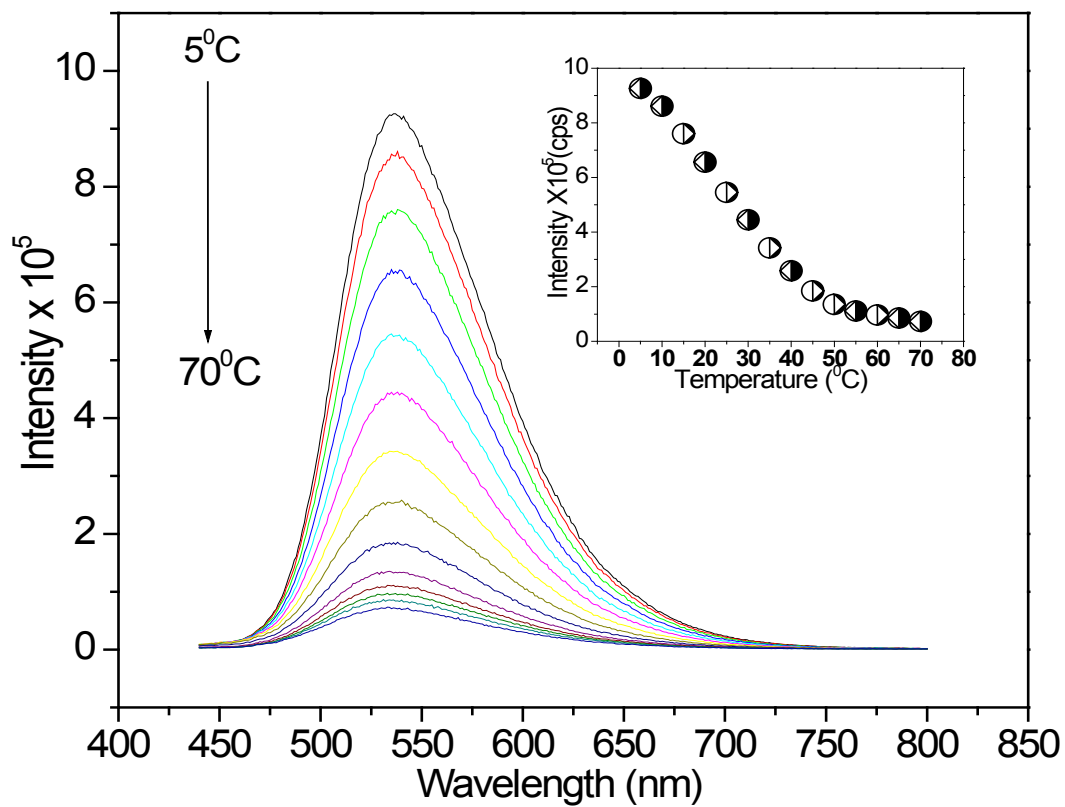
SI Fig. 5 Plots of PL-peak position of PD solution (0.1%, w/v) (a) heating & (b) cooling



SI Fig. 6 pH dependent PL intensity Vs. temperature plot of PD doped aqueous MC solution (a) for set II and (b) set III.



SI Fig.7a Temperature dependent PL spectra of 0.1% (w/v) PD graft copolymer at pH 4 **Inset:** Plot of PL intensity Vs. temperature ($^\circ\text{C}$) for heating) process of the same system



SI Fig. 7b Temperature dependent PL spectra of 0.1% (w/v) PD graft copolymer at pH 9.2 **Inset:** Plot of PL intensity Vs. temperature ($^{\circ}$ C) for heating process of the system