Supporting Information

Thermo and pH Dual Responsive Polypeptide Derived from "Clickable" Poly(γ-3-methylthiopropyl-$_L$-glutamate)

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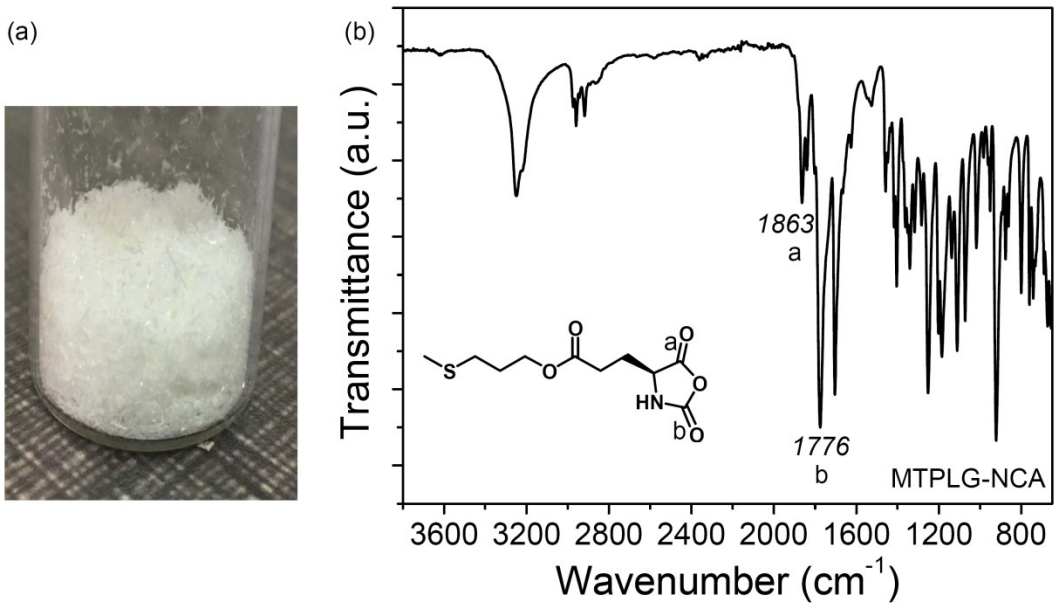

Figure S1. (a) Optical image and (b) FTIR spectrum of MTPLG-NCA in the solid state.

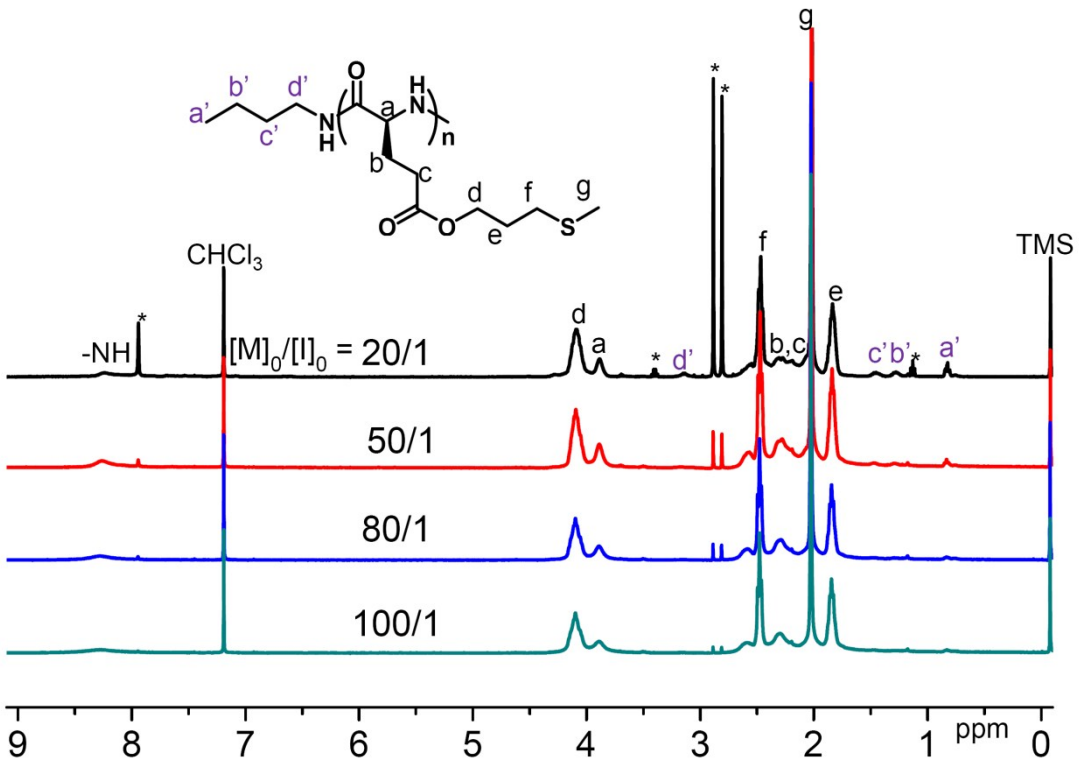

Figure S2. ^{1}H NMR spectra of PMTPLG samples prepared from ring-opening polymerizations with different initial monomer to initiator ratios ($[M]_0/[I]_0$, asterisks signify DMF and diethyl ether signals).

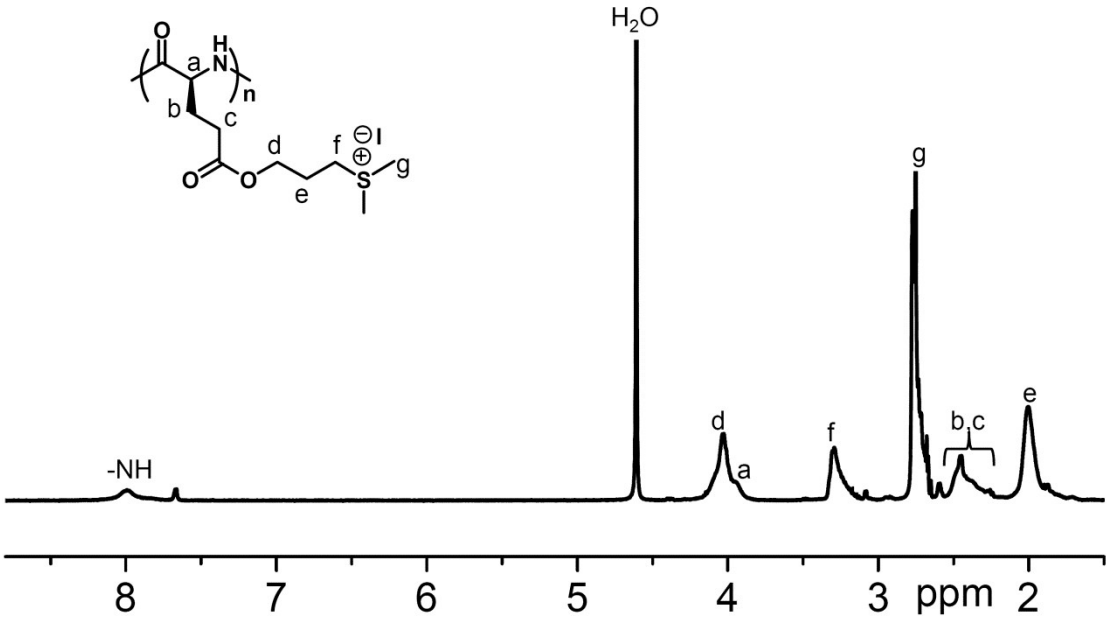

Figure S3. ^{1}H NMR spectrum of PPLG-DMS-I in D_2O.

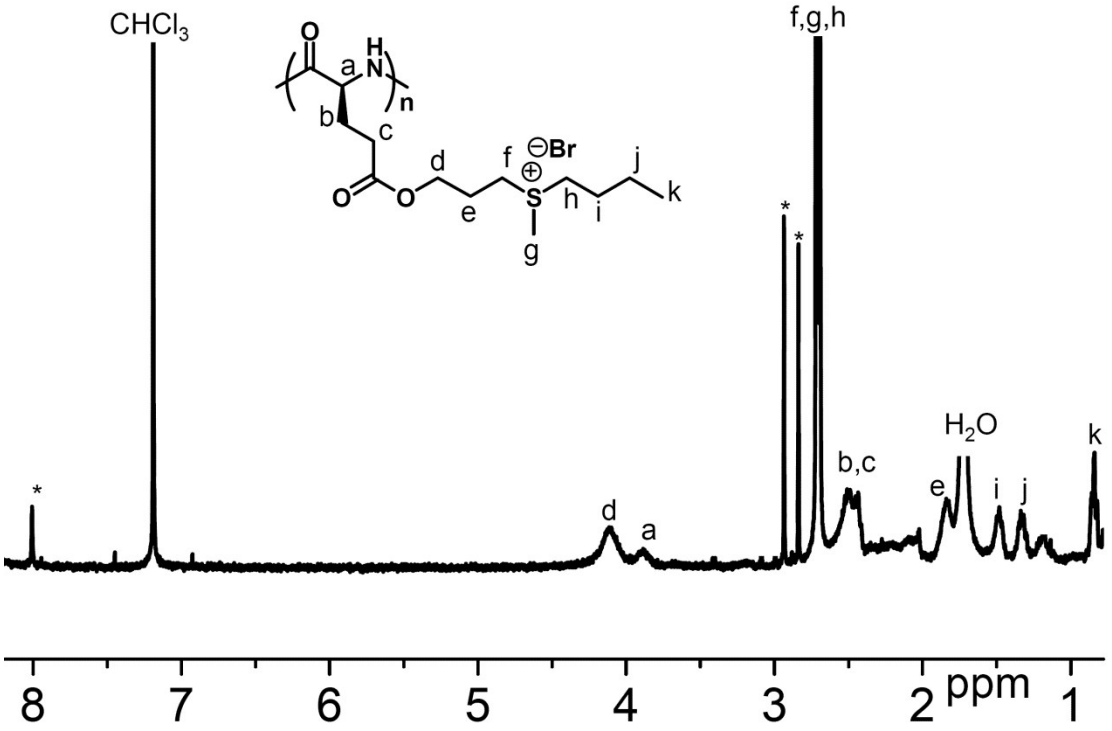

Figure S4. ^{1}H NMR spectrum of PPLG-MBS-Br in $CDCl_3$ (asterisks signify DMF signals).

Table S1. Solubility of PMTPLG and polypeptides bearing various sulfonium moieties

samples	TCM	THF	DMF	DMSO	H_2O	MeOH	EtOH
PMTPLG	S	S	S	S	I	I	I
PPLG-DMS-I	I	I	S	S	S	U	I
PPLG-DMS-BF_4	I	I	S	S	S	U	I
PPLG-MBS-Br	S	S	S	S	I	U	U
PPLG-MBS-I	S	S	S	S	I	U	I
PPLG-MBS-BF_4	S	S	S	S	I	I	I
PPLG-MPS-Br	S	S	S	S	I	U	U
PPLG-MPS-I	S	S	S	S	I	U	I
PPLG-MPS-BF_4	S	S	S	S	I	I	I
PPLG-MSEA-Cl	I	I	S	S	S	I	I
PPLG-MSEA-BF_4	I	I	S	S	S	I	I

TCM = trichloromethane or chloroform; THF = tetrahydrofuran; DMF = *N*,*N*-dimethylformamide; DMSO = dimethyl sulphoxide; MeOH = methanol; EtOH = ethanol; S = soluble; I = insoluble; U = UCST-type phase transition (concentration = 1 mg·mL^{-1}).

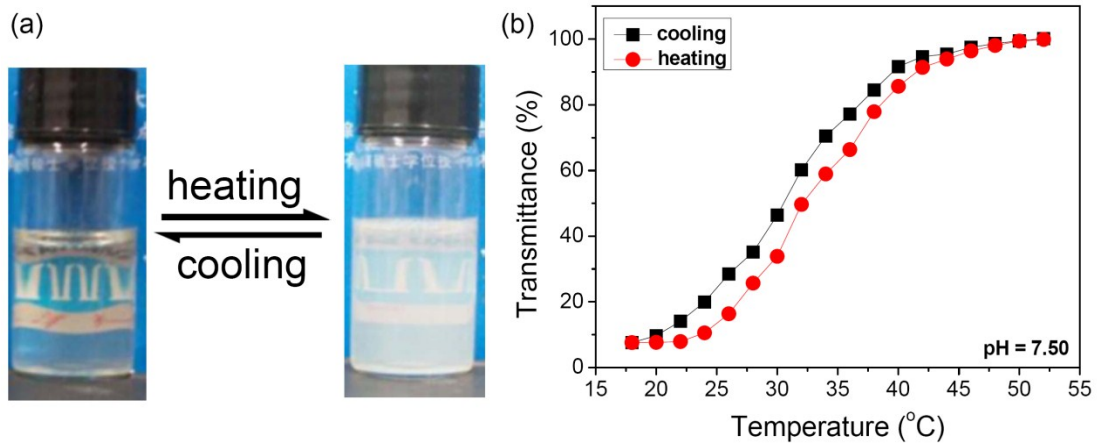

Figure S5. (a) Representative optical images of PPLG-MSEA-BF_4 aqueous solution at pH = 7.50 at different temperature to demonstrate the reversible UCST-type phase behavior. (b) Representative plot of transmittance at λ = 500 nm *versus* temperature for PPLG-MSEA-BF_4 aqueous solutions at pH = 7.50 in a cooling/heating cycle (polymer concentration = 5 mg·mL^{-1}).

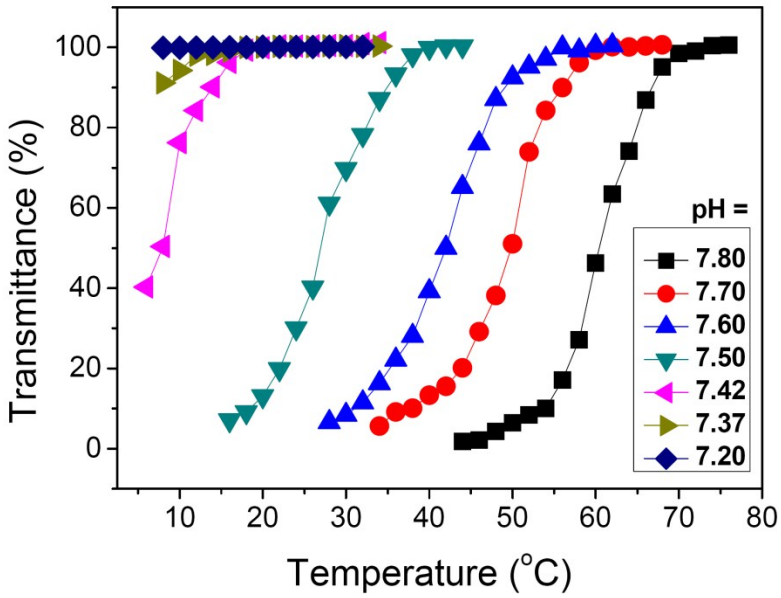

Figure S6. Plots of transmittance at λ = 500 nm *versus* temperature for PPLG-MSEA-BF_4 aqueous solutions with decreasing the pH values (polymer concentration = 5 mg·mL^{-1}).

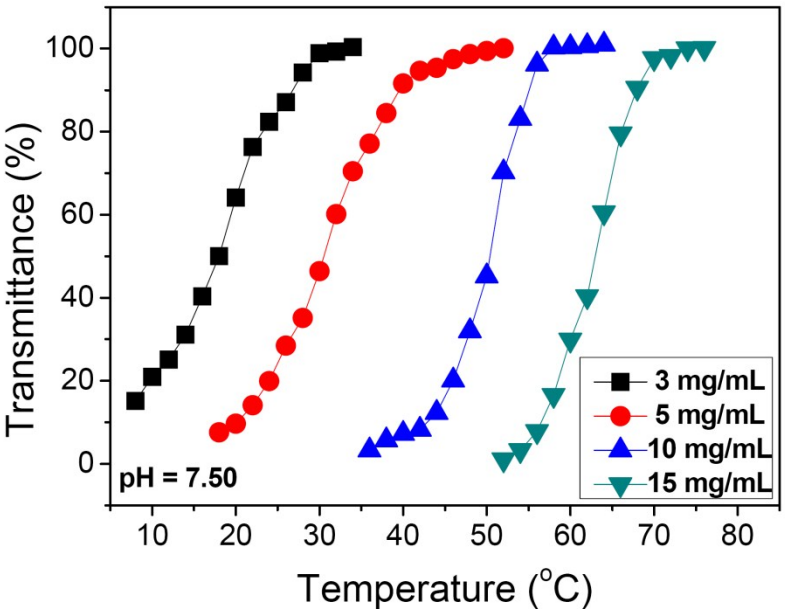

Figure S7. Plots of transmittance at λ = 500 nm *versus* temperature for PPLG-MSEA-BF_4 aqueous solutions at pH = 7.50 with different polymer concentrations.

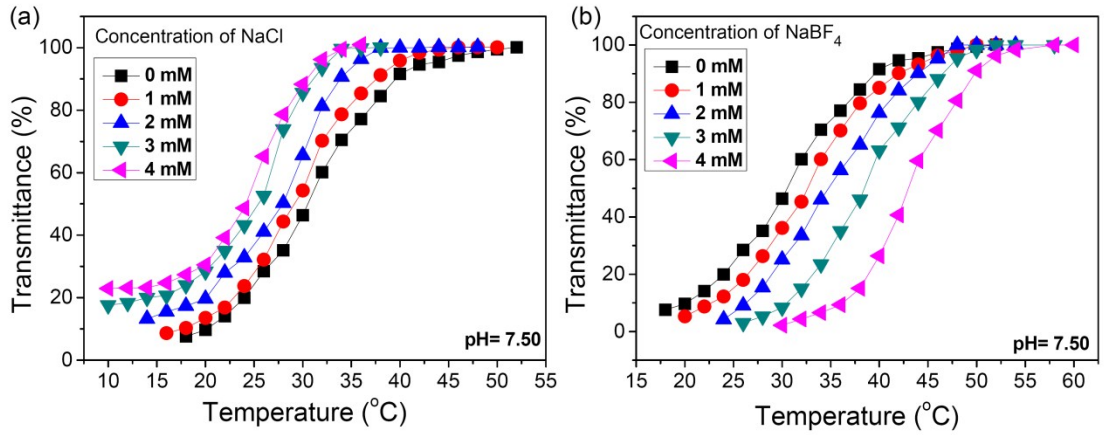

Figure S8. Plots of transmittance at λ = 500 nm *versus* temperature for PPLG-MSEA-BF_4 aqueous solutions at pH = 7.50 with increasing the concentration of (a) NaCl or (b) $NaBF_4$ (polymer concentration = 5 mg·mL^{-1}).