

# Supporting information: Engineering the Surface

## Properties of Poly(dimethyl siloxane) Utilizing

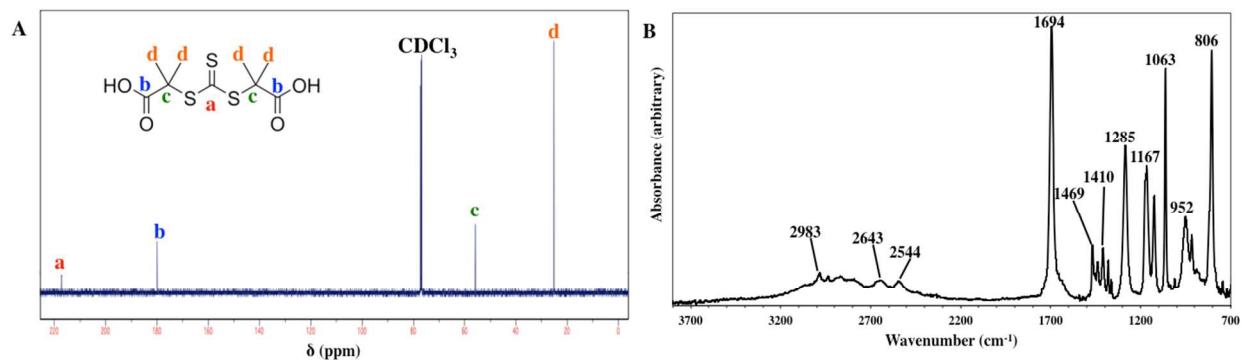
## Aqueous RAFT Photografting of Acrylate/

## Methacrylate Monomers

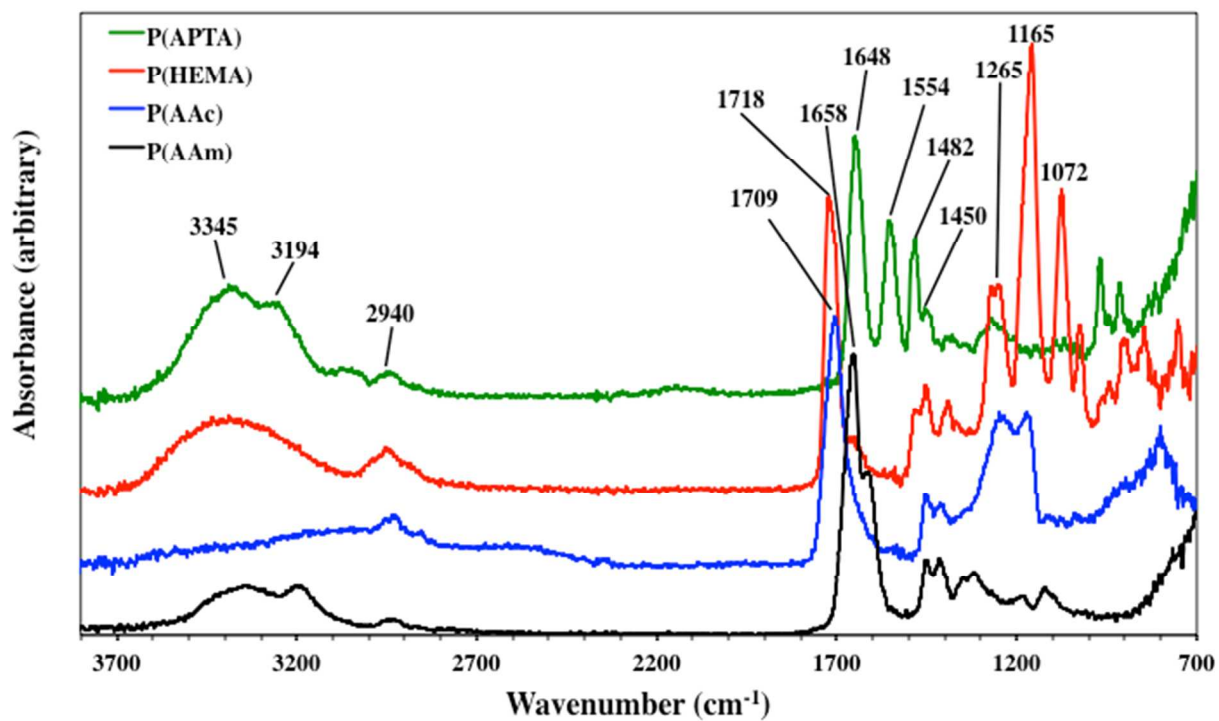
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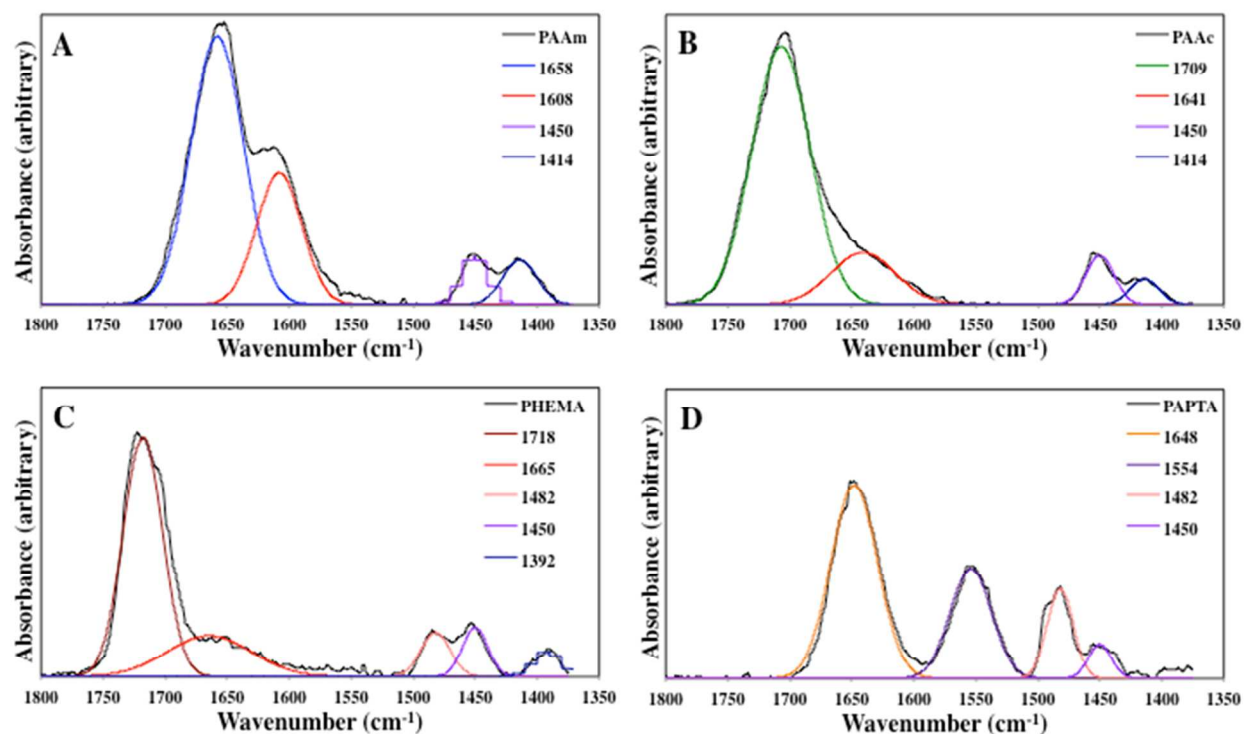
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**Figure S1.** (A)  $^{13}\text{C}$ -NMR spectra of CMP performed in deuterated chloroform ( $\text{CDCl}_3$ ) using a Varian Mercury 300 MHz broadband NMR spectrometer with a Varian 5 mm quadruple tuned probe  $\text{H}^1/\text{F}^{19}/\text{C}^{13}/\text{P}^{31}$ , and (B) ATR-FTIR of CMP.



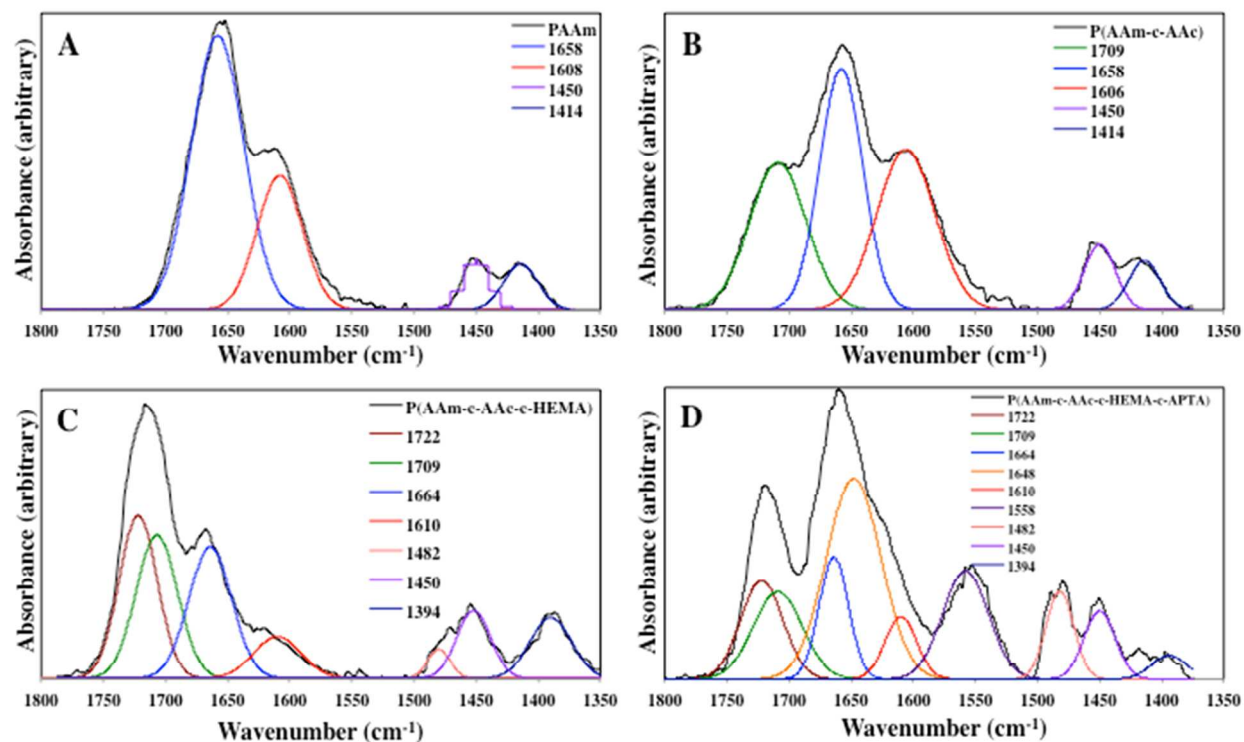
**Figure S2.** ATR-FTIR spectra of synthesized homopolymers



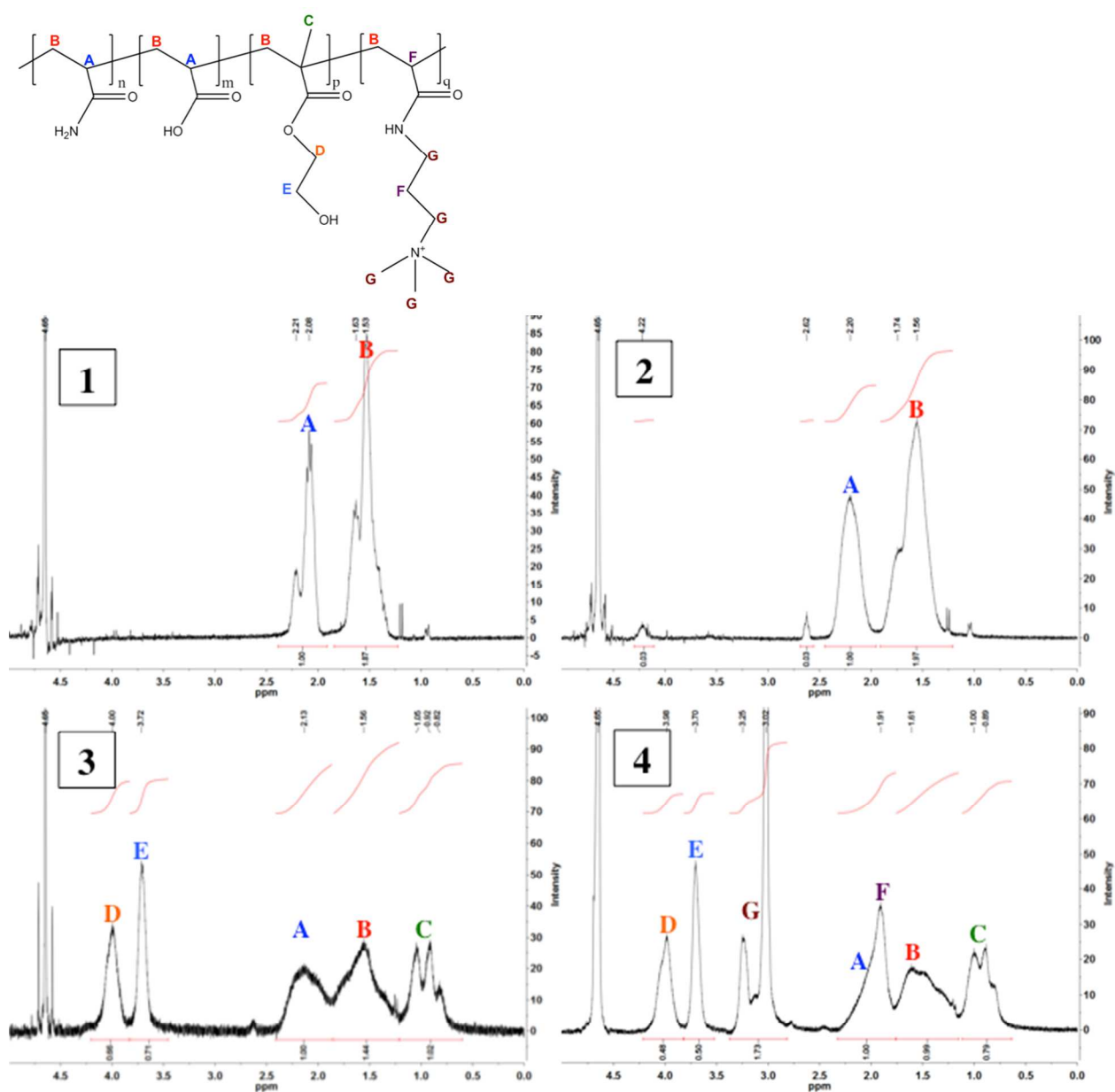
**Figure S3.** ATR-FTIR spectra of synthesized homopolymers restricted to the carbonyl absorbance region ( $1800\text{-}1350\text{ cm}^{-1}$ ) with corresponding peak fitting curves. (A) P(AAm), (B) P(AAc), (C) P(HEMA), and (D) P(APTA).

**Table S1.** Carbonyl absorbance ratios of homopolymers used for compositional analysis.

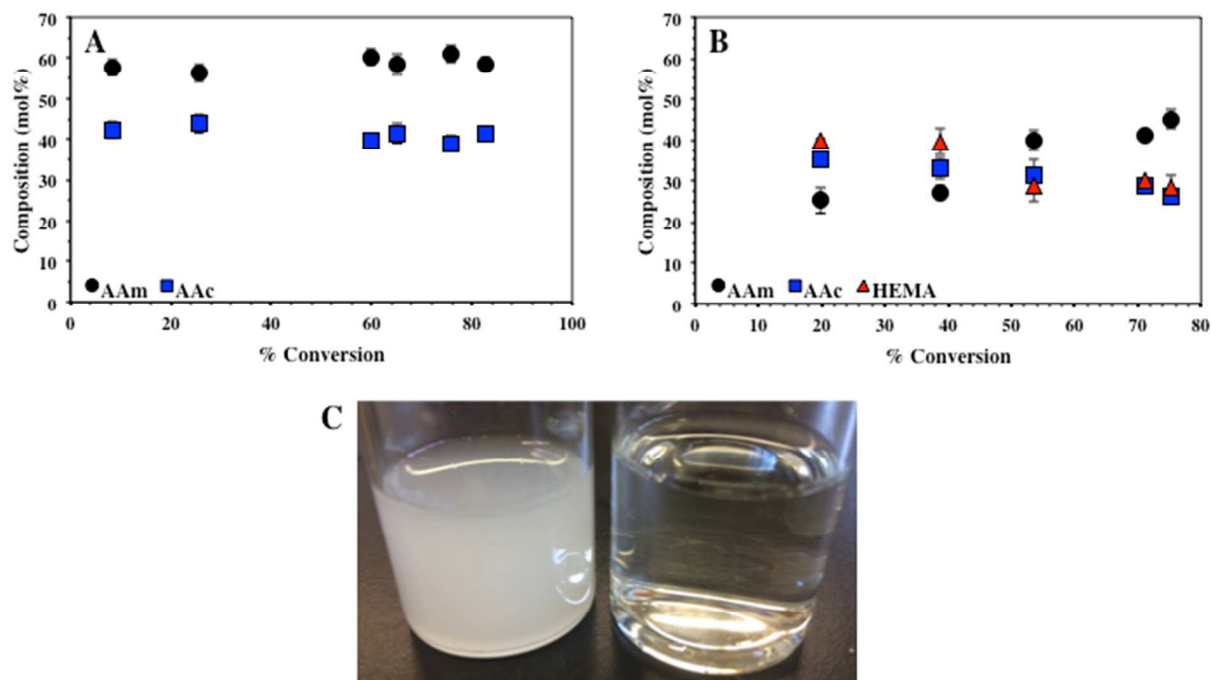
Homopolymer	Carbonyl / $1450\text{ cm}^{-1}$
P(AAm)	5.50
P(AAc)	5.25
P(HEMA)	4.86
P(APTA)	3.22



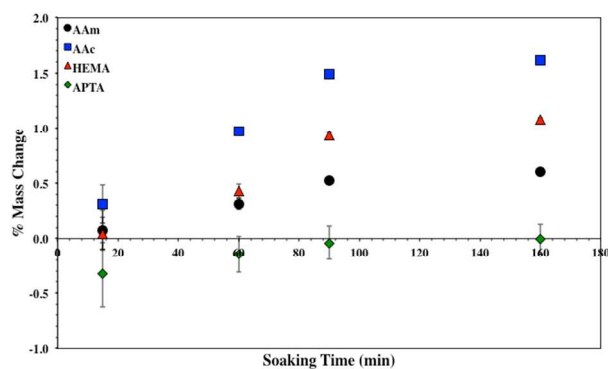
**Figure S4.** ATR-FTIR spectra of synthesized copolymers restricted to the carbonyl absorbance region ( $1800\text{--}1350\text{ cm}^{-1}$ ) with corresponding peak fitting curves. (A) P(AAm), (B) P(AAm-co-AAc), (C) P(AAm-co-AAc-co-HEMA), and (D) P(AAm-co-AAc-co-HEMA-co-APTA).



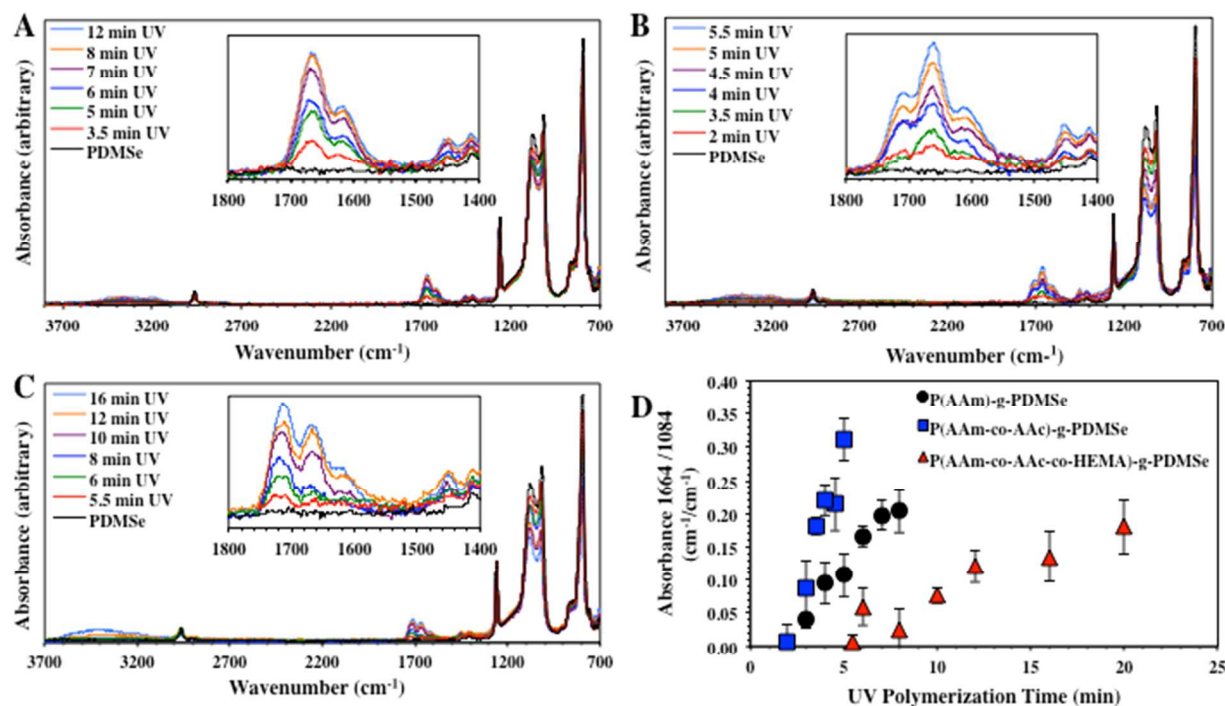
**Figure S5.**  $^1\text{H}$ -NMR of synthesized copolymers performed in  $\text{D}_2\text{O}$  at 10 mg/mL using a Varian Mercury 300 MHz broadband NMR spectrometer with a Varian 5 mm quadruple tuned probe  $\text{H}^1/\text{F}^{19}/\text{C}^{13}/\text{P}^{31}$  with corresponding peak assignments. (1) P(AAm), (2) P(AAm-co-AAc), (3) P(AAm-co-AAc-co-HEMA), and (4) P(AAm-co-AAc-co-HEMA-co-APTA).



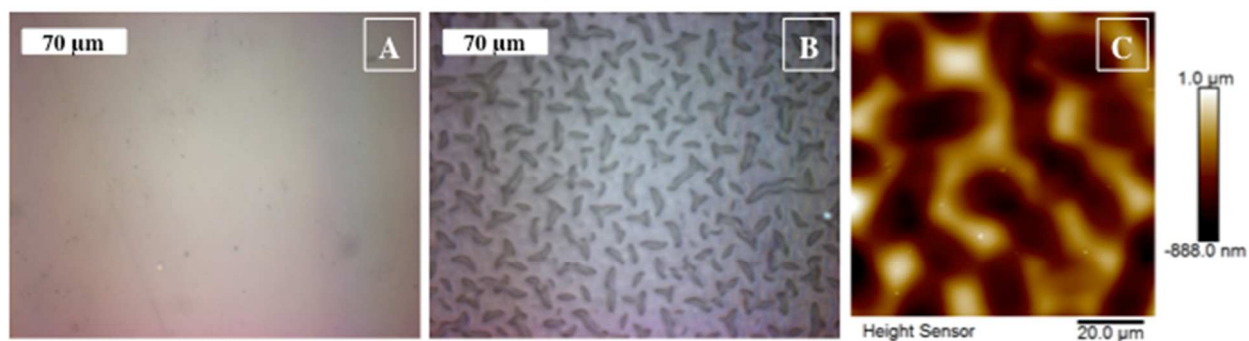
**Figure S6.** Composition % (calculated via ATR-FTIR) of monomer constituents vs. conversion for (A) P(AAm-co-AAc) and (B) P(AAm-co-AAc-co-HEMA) copolymers. (C) Concentrated solutions of P(AAm-co-AAc-co-HEMA) at (left)  $p < 0$  and (right)  $p < 0$  highlighting solubility differences at varying compositions.



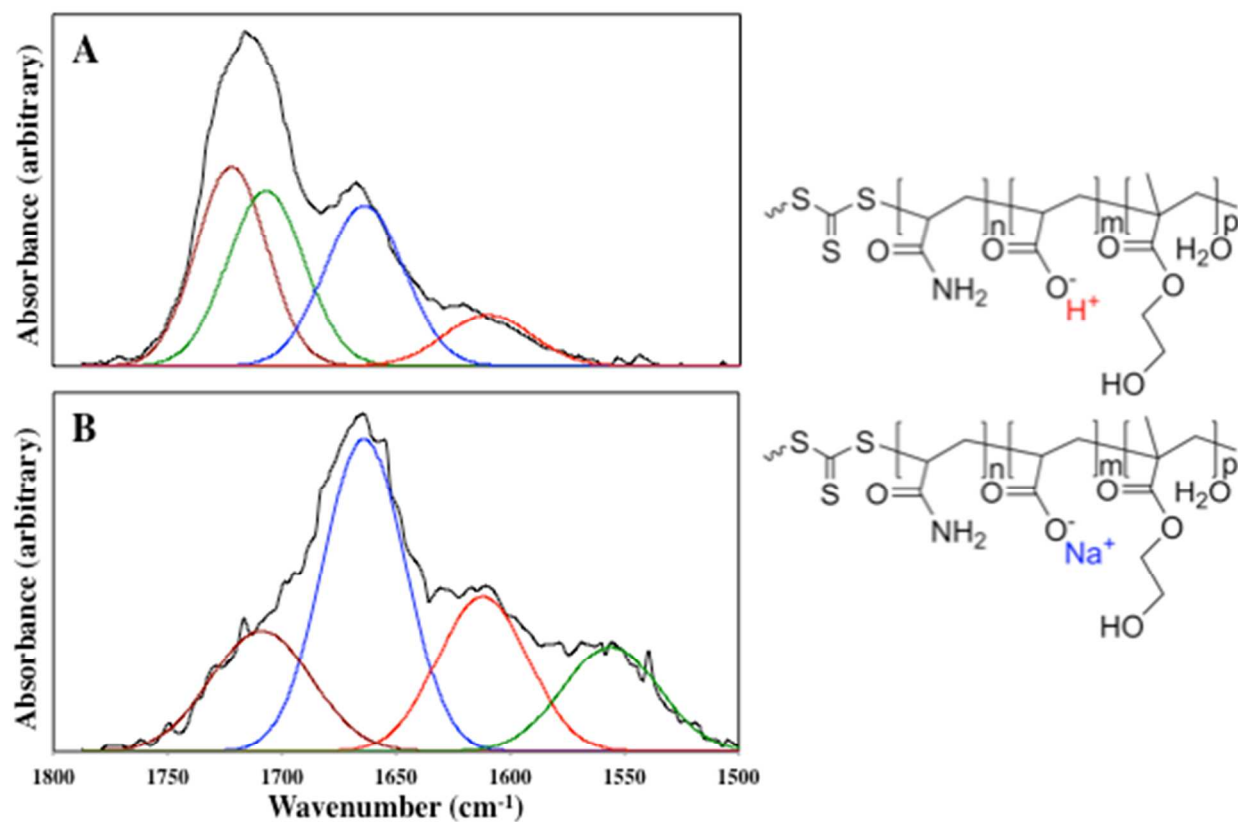
**Figure S7.** % mass change of 15 mm diameter, 600  $\mu$ m thick PDMS disks immersed in 25 wt% monomer for varying periods of time. APTA produced no significant mass change indicating an inability to swell the PDMS network.



**Figure S8.** ATR-FTIR spectra of (A) P(AAm)-g-PDMS<sub>Se</sub>, (B) P(AAm-co-AAc)-g-PDMS<sub>Se</sub>, and (C) P(AAm-co-AAc-co-HEMA)-g-PDMS<sub>Se</sub> as a function of UV grafting time. Inset spectra show the carbonyl absorbance region. (D) Relative absorbance ratios between R<sub>1</sub>C=OR<sub>2</sub> and Si-O peaks for the three polymer systems.



**Figure S9.** Optical microscope images of grafted PDMS<sub>Se</sub> (A) without and (B) with the undesirable “shark tooth” morphology. (C) AFM height scan of grafted PDMS<sub>Se</sub> with the “shark tooth” morphology. Sample imaged while immersed in DI water.



**Figure S10.** ATR-FTIR spectra of graft-PDMS surfaces restricted to the carbonyl absorbance region (1800-1500  $\text{cm}^{-1}$ ) with corresponding peak fitting curves highlighting the peak shift caused by Na<sup>+</sup> binding to the carboxylic acid of AAc. (A) P(AAm-co-AAc-co-HEMA) and (B) P(AAm-co-AAc Na<sup>+</sup>-co-HEMA)