# Supporting Information for

# Cationic Methacrylate Polymers Containing Chiral Amino Acid Moieties: Controlled Synthesis via RAFT Polymerization

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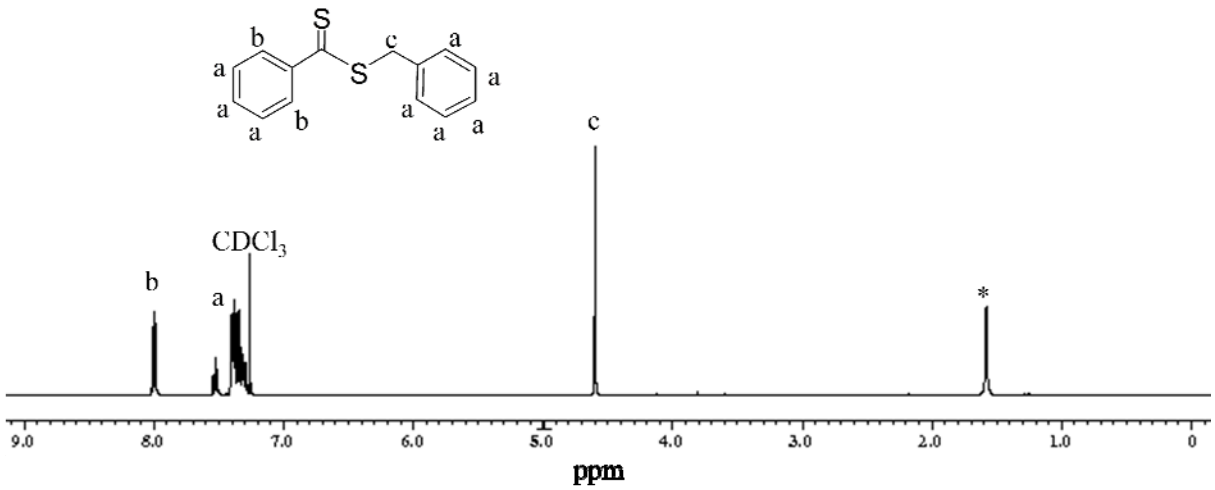


**Figure S1.** $^{1}$H NMR spectrum of BDB in $CDCl_3$ (* denotes $H_2O$ resonance).

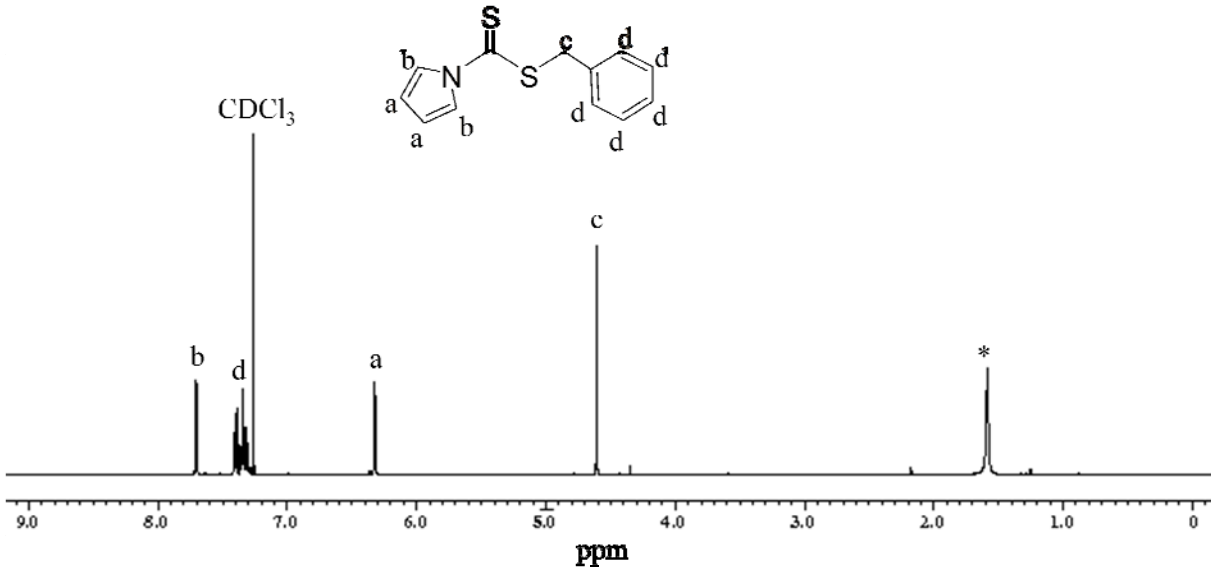


**Figure S2.** $^{1}$H NMR spectrum of BPC in $CDCl_3$ (* denotes $H_2O$ resonance).

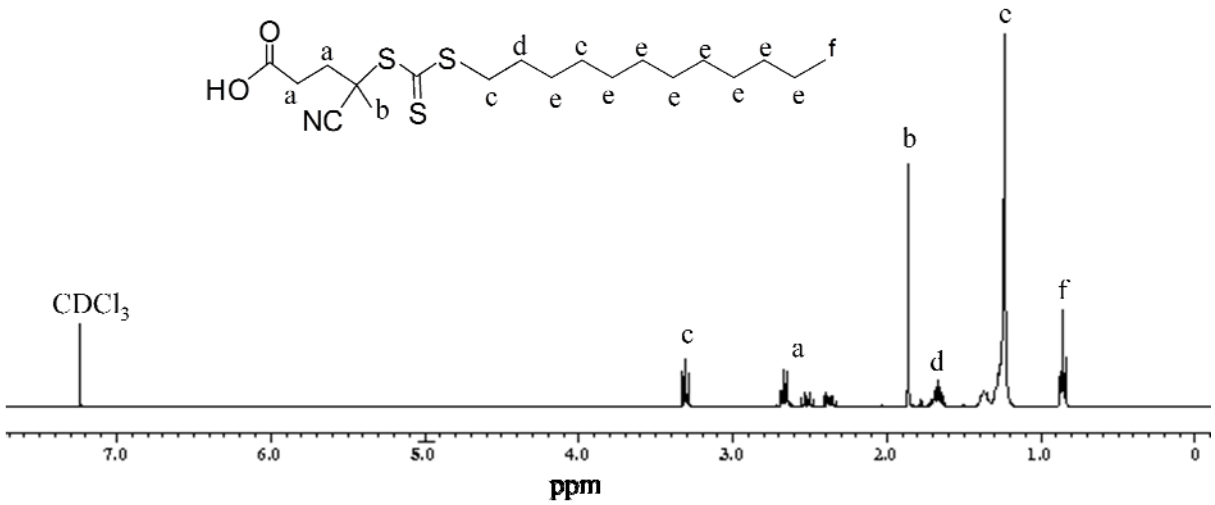


**Figure S3.** $^{1}$H NMR spectrum of CDP in $CDCl_3$.

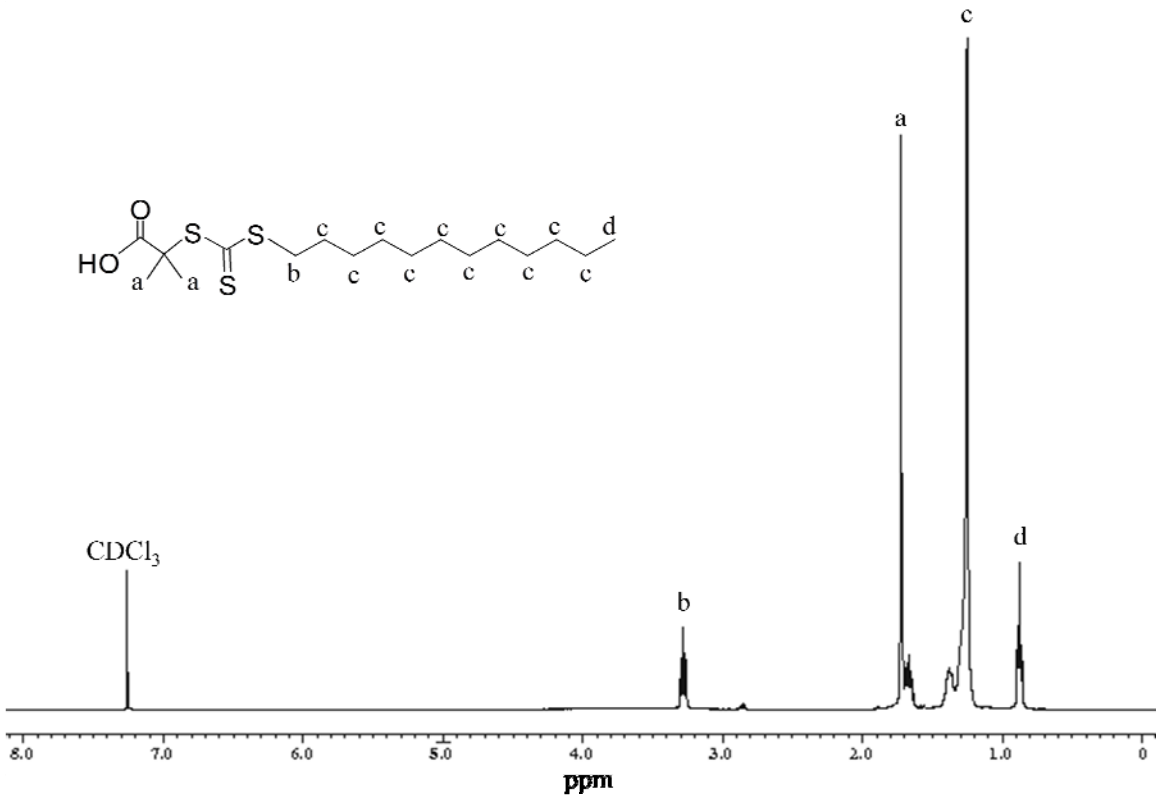


**Figure S4.** $^{1}$H NMR spectrum of DMP in $CDCl_3$.

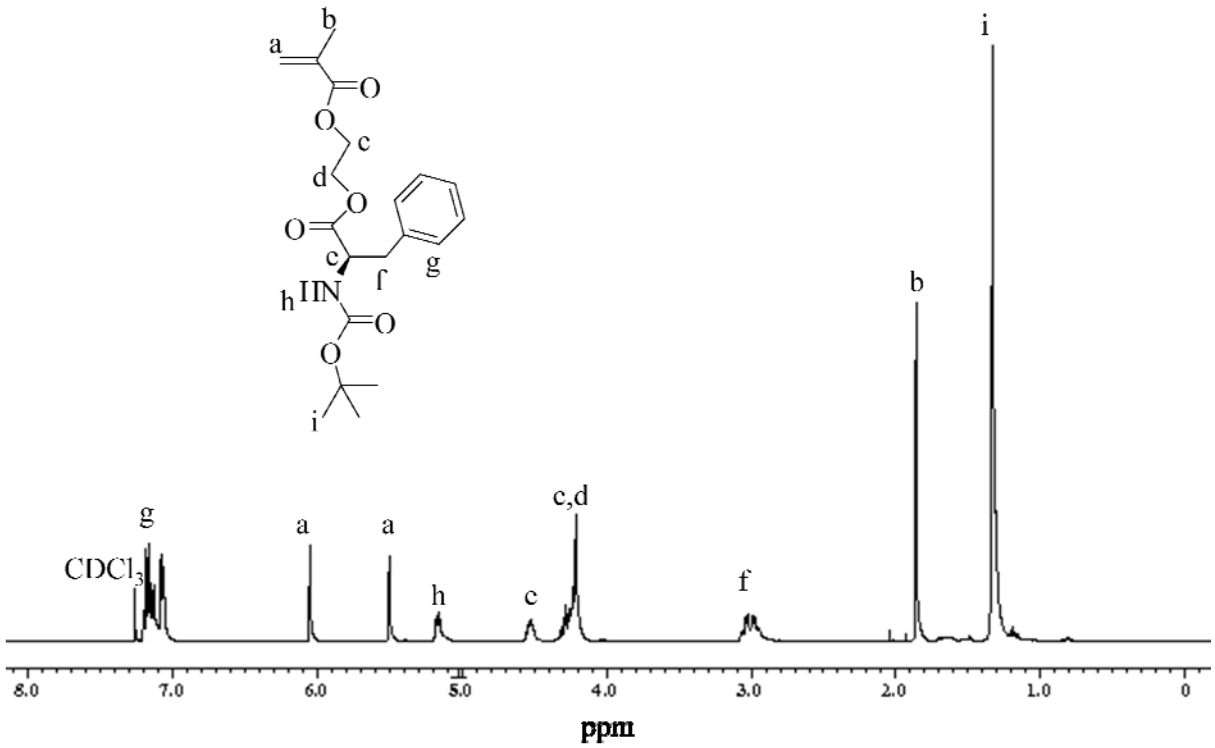


**Figure S5.** $^{1}$H NMR spectrum of Boc-Phe-HEMA in $CDCl_3$.

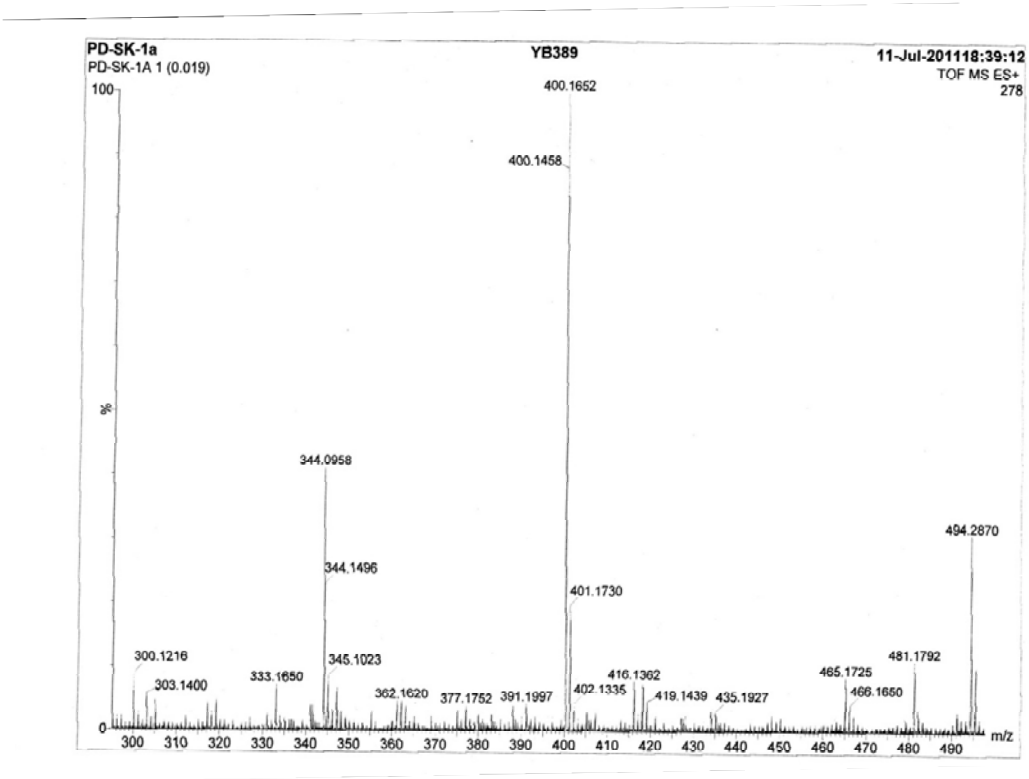


**Figure S6.** ESI-MS spectrum of Boc-Phe-HEMA (calculated for [M + $Na^+$]: 400.18 *m*/*z*, observed 400.16 *m*/*z*).

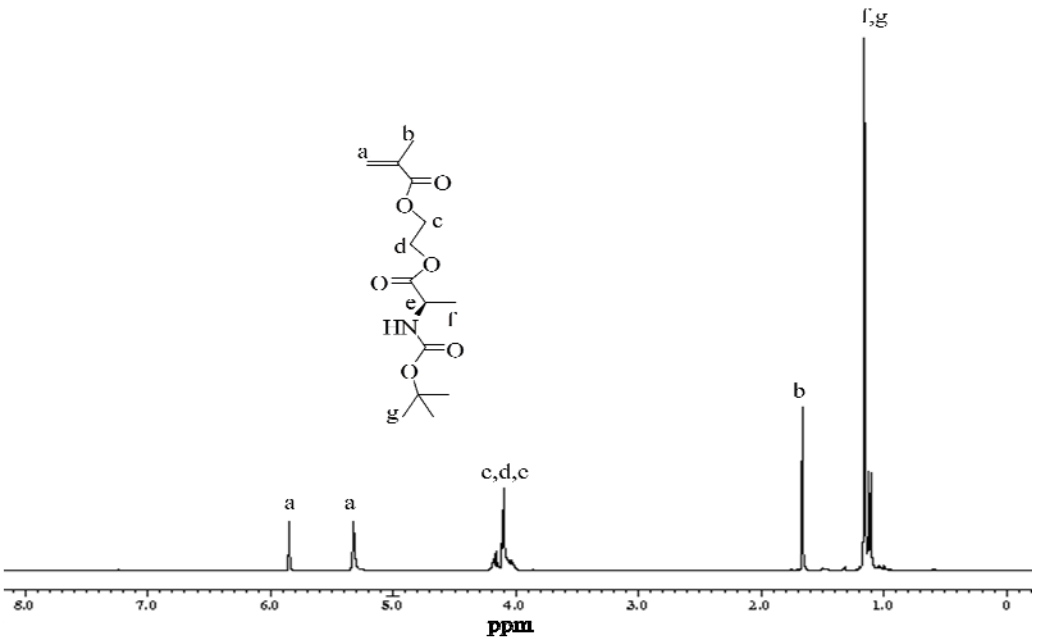


**Figure S7.** $^{1}$H NMR spectrum of Boc-Ala-HEMA in $CDCl_3$.

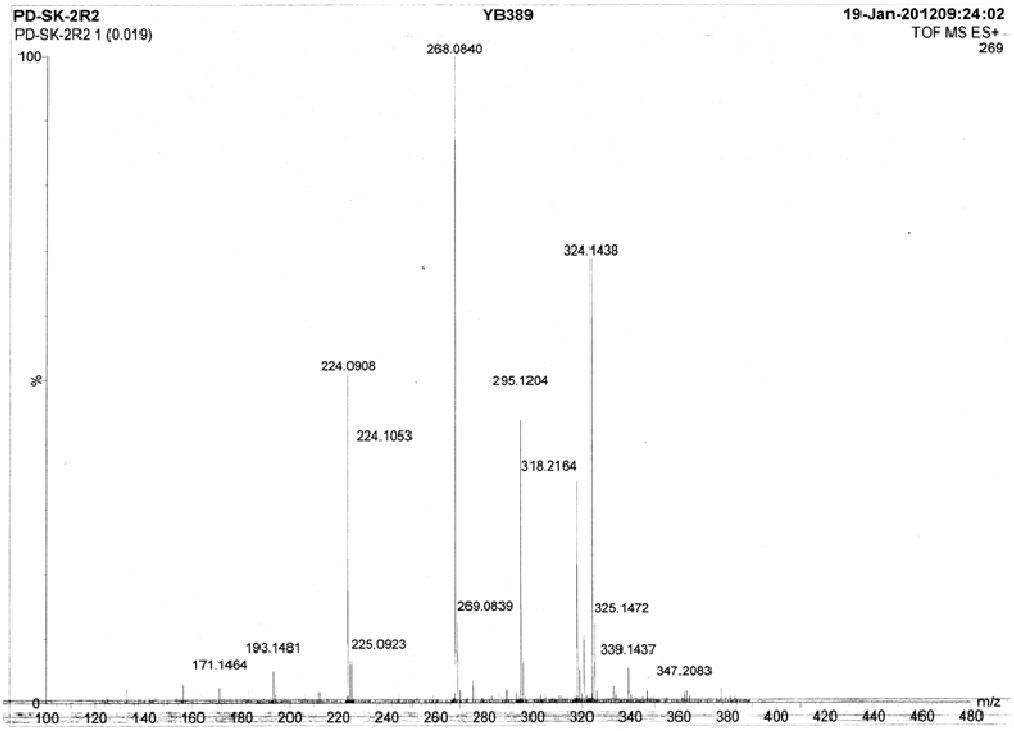


**Figure S8.** ESI-MS spectrum of Boc-Ala-HEMA (calculated for [M + $Na^+$]: 324.15 *m*/*z*, observed 324.14 *m*/*z*).

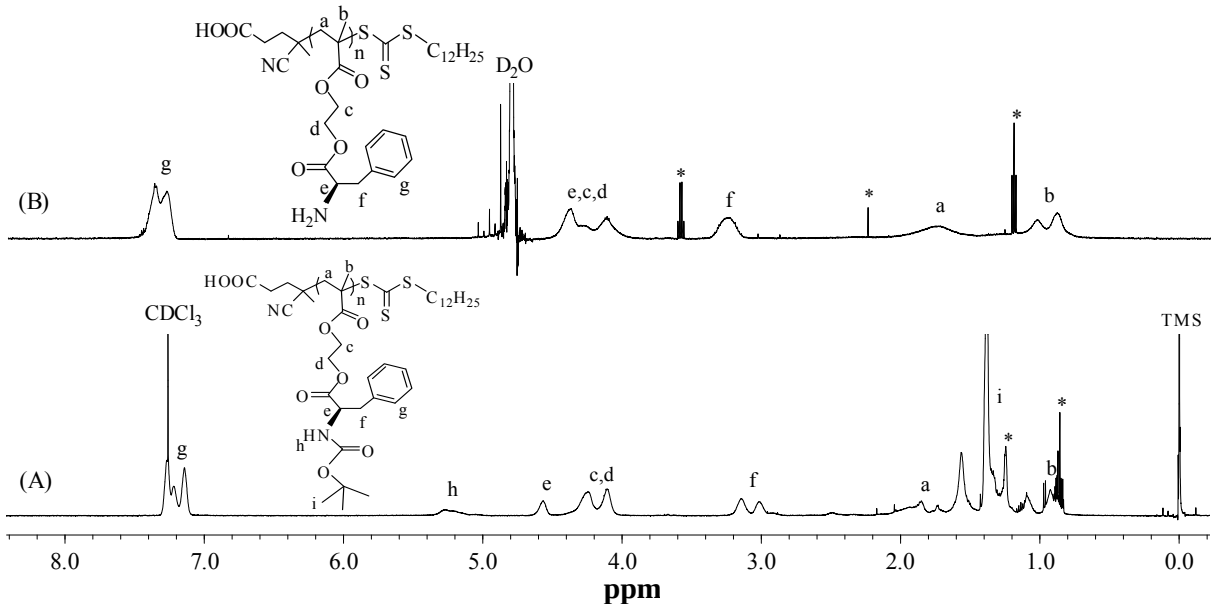


**Figure S9.** $^{1}$H NMR spectra of homopolymers (A) P(Boc-Phe-HEMA) in $CDCl_3$ and (B) P(Phe-HEMA) in $D_2O$ (* denotes the solvent resonances).

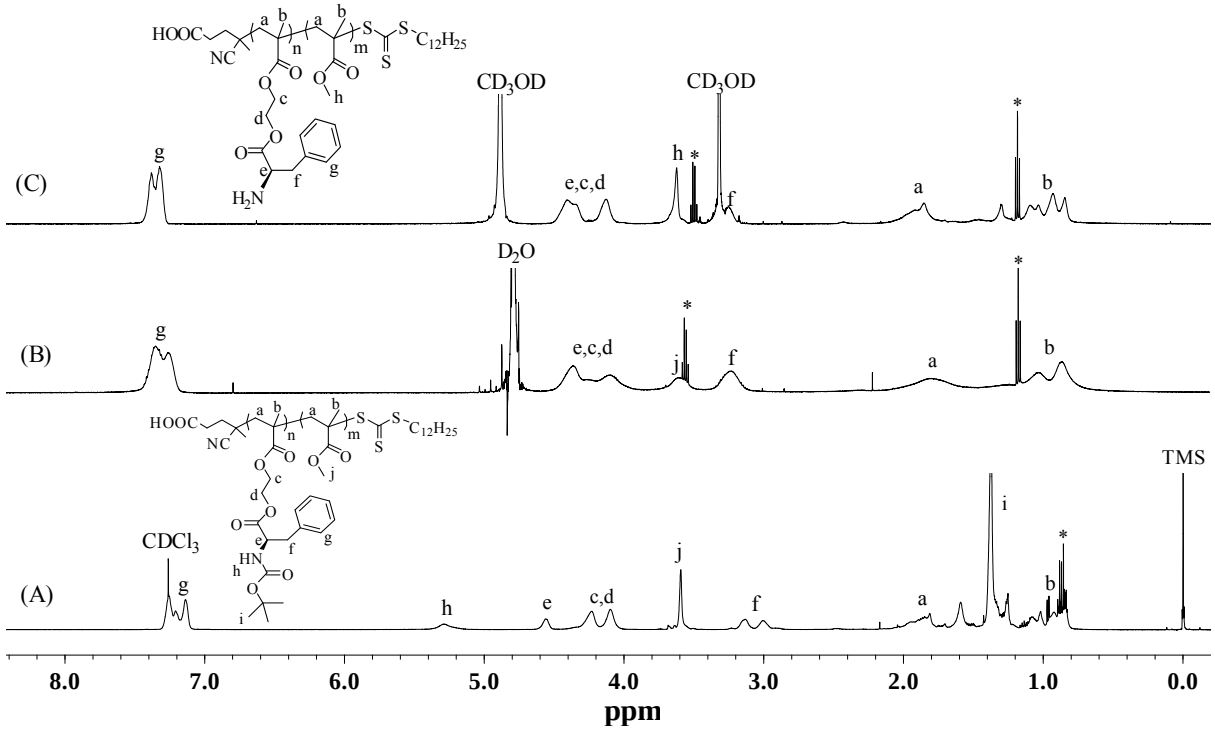


**Figure S10.** $^{1}$H NMR spectra of block copolymer; (A) P(Boc-Phe-HEMA)-*b*-PMMA in $CDCl_3$, (B) P(Phe-HEMA)-*b*-PMMA in $D_2O$, and (C) P(Phe-HEMA)-*b*-PMMA in $CD_3OD$. (* denotes the solvent resonances)

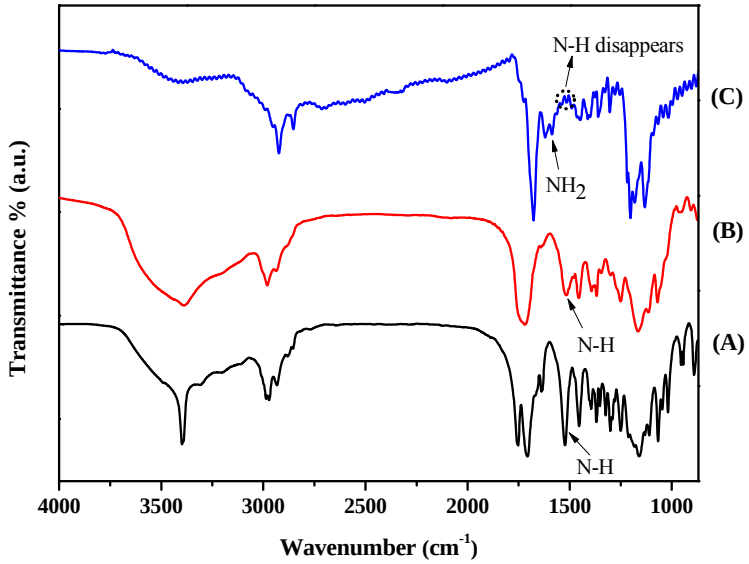


**Figure S11.** FT-IR spectra of (A) Boc-Ala-HEMA (B) P(Boc-Ala-HEMA) and (C) P(Ala-HEMA).

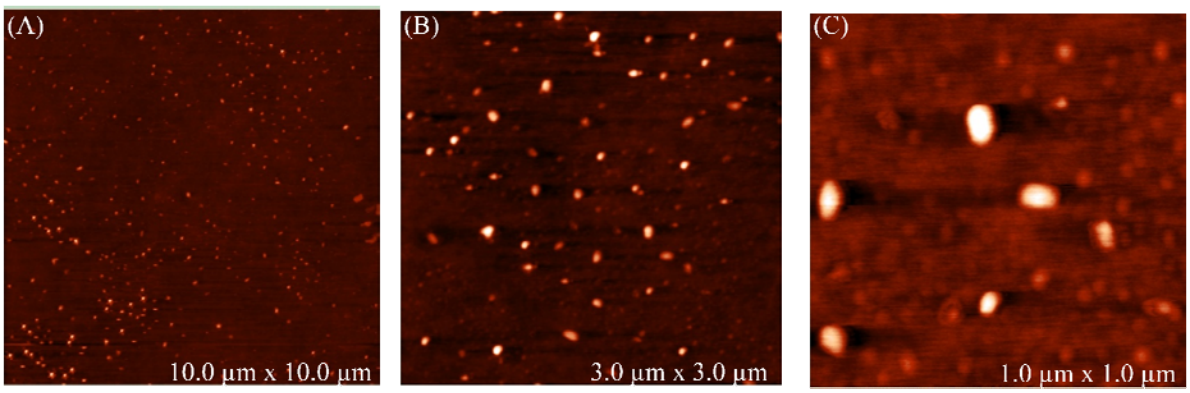


**Figure S12.** AFM images (height) of block copolymer P(Ala-HEMA)-*b*-PMMA in aqueous solution (0.08 mg/mL).

**Table S1.** Solubility studies for P(Boc-AA-HEMA)[a]

| Solvent | Solubility of | |
|---|---|---|
| | P(Boc-Phe-HEMA) | P(Boc-Ala-HEMA) |
| water | - | - |
| Acetone | + | + |
| $CHCl_3$ | + | + |
| $CH_2Cl_2$ | + | + |
| $CCl_4$ | + | + |
| Methanol | + | + |
| Ethanol | + | + |
| DMF | + | + |
| DMSO | + | + |
| THF | + | + |
| Pet Ether | - | - |
| Diethyl Ether | + | + |
| Ethyl Acetate | + | + |
| Hexane | - | - |
| Benzene | + | + |
| Toluene | + | + |
| 1,4-Dioxane | + | + |
| Acetonitrile | + | + |

[a]The symbols (+) and (-) indicate soluble and insoluble, respectively.

**Spectroscopic Analysis of *ω*-Trithiocarbonate Moiety.**

The % living chain ends were calculated using UV-Vis spectroscopy.

1 mg of CDP (MW = 403.67) was dissolved in 1 ml of DMF and from this solution 50 µL was taken out and was added in 2 ml of DMF (0.0604 mM solution). UV-Vis spectrophotometer (path length = 1 cm) was used to determine absorbance at 307 nm, which was 0.752. From this result, the molar absorptivity was calculated as 12450 $M^{-1}$ $cm^{-1}$.

1.3 mg of CDP (MW = 403.67) was dissolved in 1.3 ml of DMF and from this solution 50 µL was taken out and was added in 2 ml of DMF (0.0604 mM solution). UV-Vis spectrophotometer (path length = 1 cm) was used to determine absorbance at 307 nm, which was 0.737. From this result, the molar absorptivity was calculated as 12202 $M^{-1}$ $cm^{-1}$.

Average molar absorptivity = 12326 $M^{-1}$ $cm^{-1}$ was used for further calculations.

P(Boc-Ala-HEMA) (from two different measurements in DMF): Using molar absorptivity = 12326 $M^{-1}$ $cm^{-1}$ , the $M_{n,UV\text{-}VIS}$ = 4,340 g/mol was determine from the UV-Vis spectrophotometer. From GPC, $M_n$ = 4,300 g/mol was determine (Table 2 in the manuscript). This indicates ≈ 100% of P(Boc-Ala-HEMA)-macro CTA has living chain ends.

P(Boc-Phe-HEMA) (from two different measurements in DMF): Using molar absorptivity = 12326 $M^{-1}$ $cm^{-1}$ , the $M_{n,UV\text{-}VIS}$ = 4,460 g/mol was determine from the UV-Vis spectrophotometer. From GPC, $M_n$ = 4,650 g/mol was determine (Table 2 in the manuscript). This indicates ≈ 96% of P(Boc-Phe-HEMA)-macro CTA has living chain ends.