

## Supporting Information for

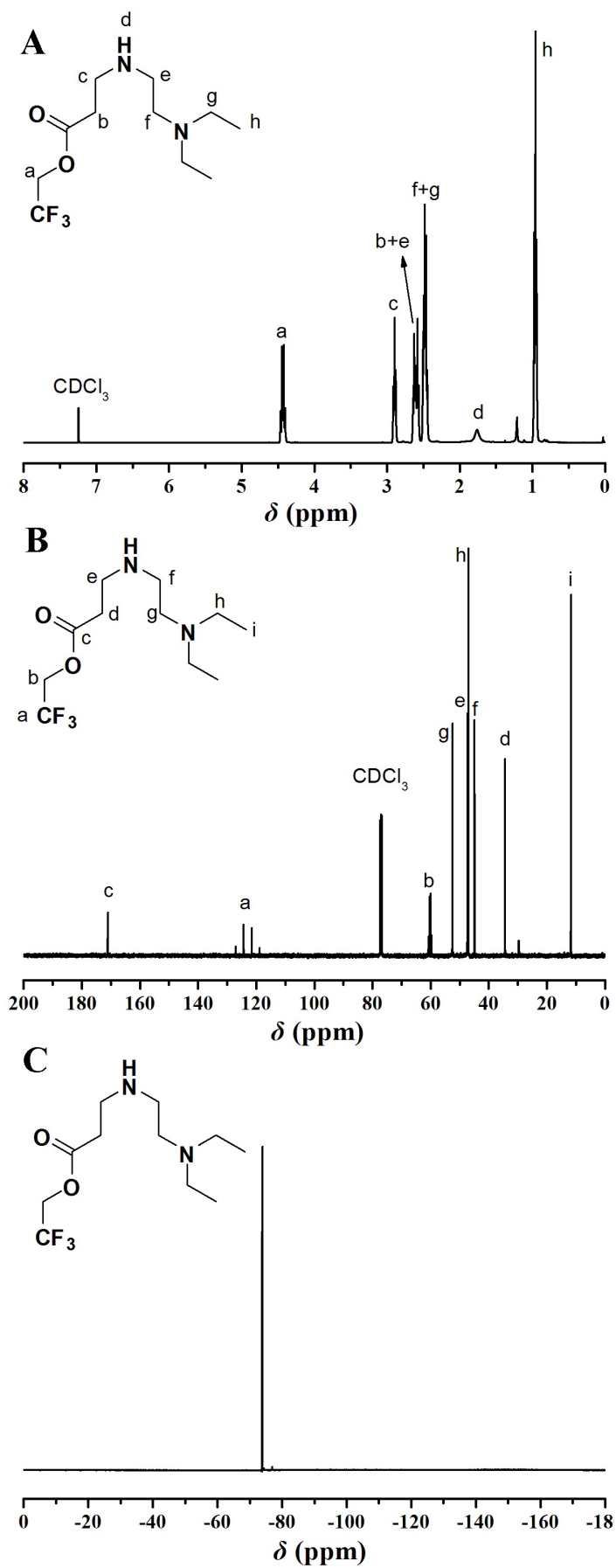
# Oxygen and Carbon Dioxide Dual Gas-Responsive Homopolymers and Diblock Copolymers Synthesized by RAFT Polymerization

*Xue Jiang,<sup>1</sup> Feng Chun,<sup>1,2,\*</sup> Guolin Lu,<sup>1</sup> Huang Xiaoyu<sup>1,\*</sup>*

<sup>1</sup> Key Laboratory of Synthetic and Self-Assembly Chemistry for Organic Functional Molecules, Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, 345 Lingling Road, Shanghai 200032, People's Republic of China

<sup>2</sup> State Key Laboratory of Molecular Engineering of Polymers, Department of Macromolecular Science, Fudan University, 220 Handan Road, Shanghai 200433, People's Republic of China

\* To whom correspondence should be addressed, E-mail: cfeng@mail.sioc.ac.cn (Tel: +86-21-54925606, Fax: +86-21-64166128), xyhuang@mail.sioc.ac.cn (Tel: +86-21-54925310, Fax: +86-21-64166128).



**Figure S1.**  $^1\text{H}$  (A),  $^{13}\text{C}$  (B), and  $^{19}\text{F}$  (C) NMR spectra of TF-DEAE in  $\text{CDCl}_3$ .

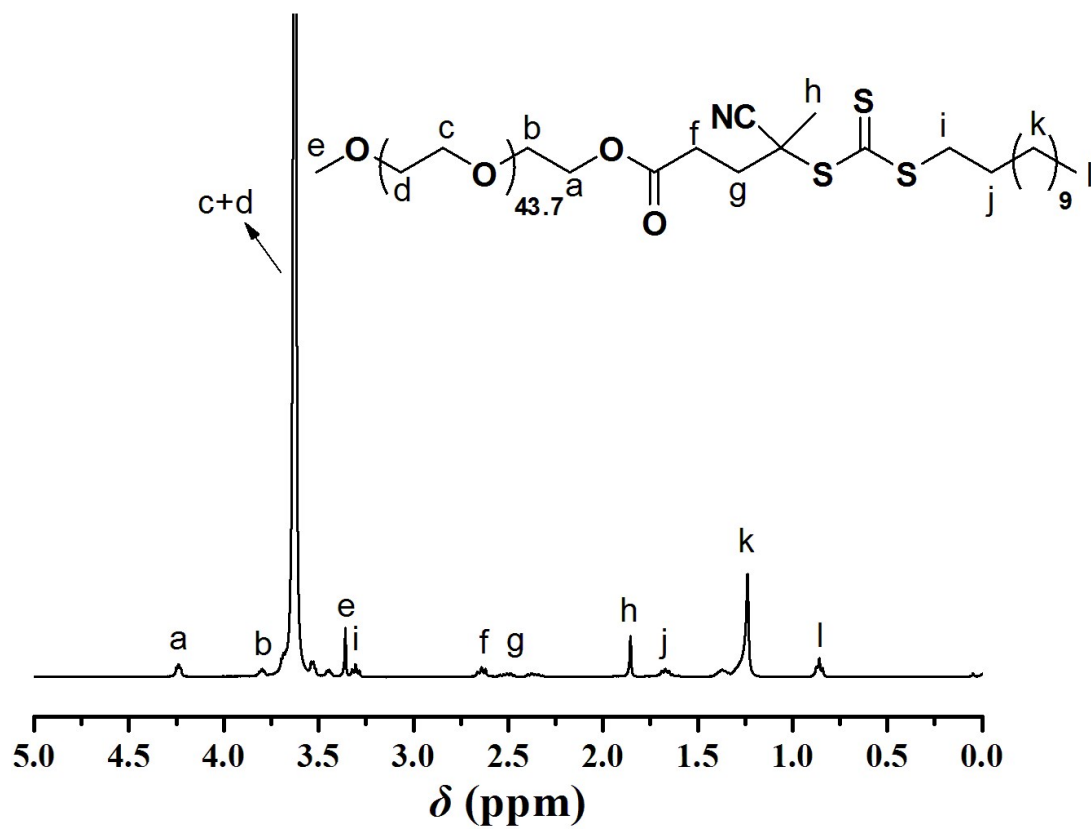
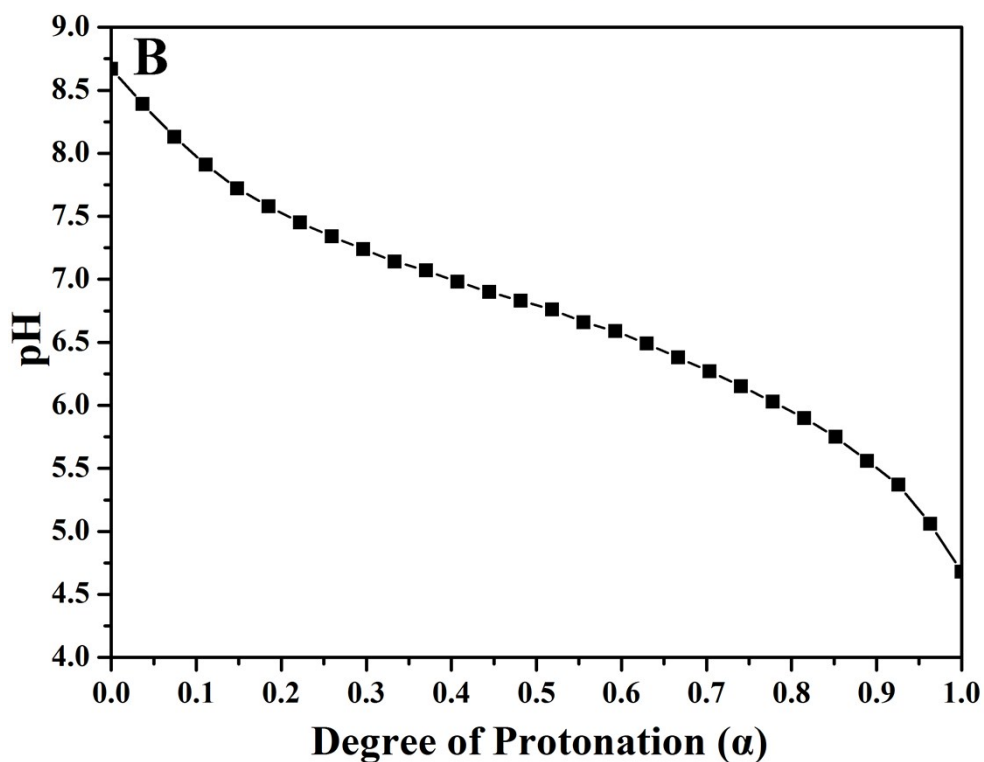
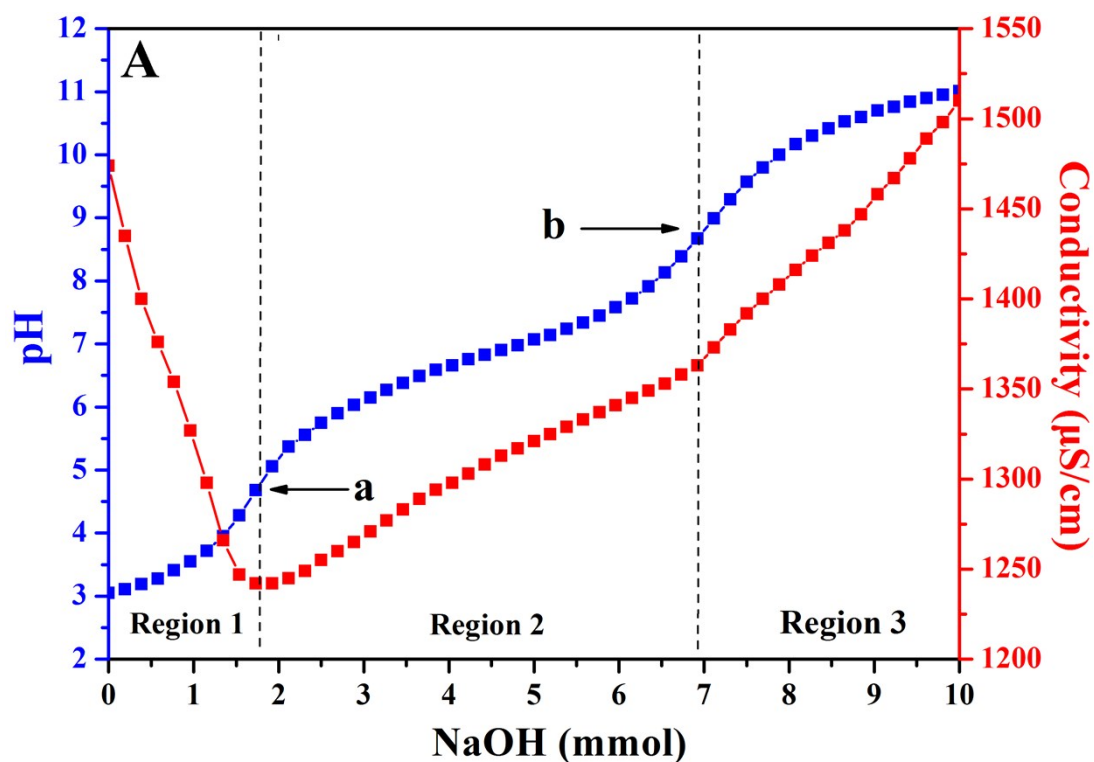


Figure S2.  $^1\text{H}$  NMR spectrum of PEG-CTA in  $\text{CDCl}_3$ .



**Figure S3.** (A) Titration curves of PEG-*b*-poly(TF-DEAE-AM) **4b** diblock copolymer (1.0 mg/mL) at 25°C in 10 mM NaCl; (B) Profile of dependence of protonation on pH. We prepared the polymer solution at pH = 3.0 while the solution contained H<sup>+</sup>, Na<sup>+</sup>, OH<sup>-</sup>, Cl<sup>-</sup>, and protonated DEAE macro-ions. With the addition of

NaOH, the concentration of  $H^+$  decreased and the concentration of  $Na^+$  ion increased (region 1). The conductivity of polymer solution decreased to the first transition point (a) while pH displayed a sharp rising because the mobility of  $H^+$  ( $\lambda_{H^+} = 350 \text{ S cm}^2/\text{mol}$ ) is much larger than that of  $Na^+$  ( $\lambda_{Na^+} = 50.5 \text{ S cm}^2/\text{mol}$ ). Region 2 corresponded to the deprotonation of  $NH^+(C_2H_5)_2$  groups with the continual addition of base as pH climbed slowly. The progressively increased conductivity indicated the increase of the concentration of  $Na^+$ . The deprotonation process ended at the second transition point (b), and beyond this point pH and conductivity continually increased with the addition of base in region 3. As a result, points “a” and “b” represented the starting and ending point of the deprotonation process of the protonated DEAE macro-ions.