Electronic Supplementary Material (ESI) for Polymer Chemistry.

Supporting information to

Rapid Synthesis of Ultrahigh Molecular Weight and Low Polydispersity Polystyrene Diblock Copolymers by RAFT-mediated Emulsion Polymerization

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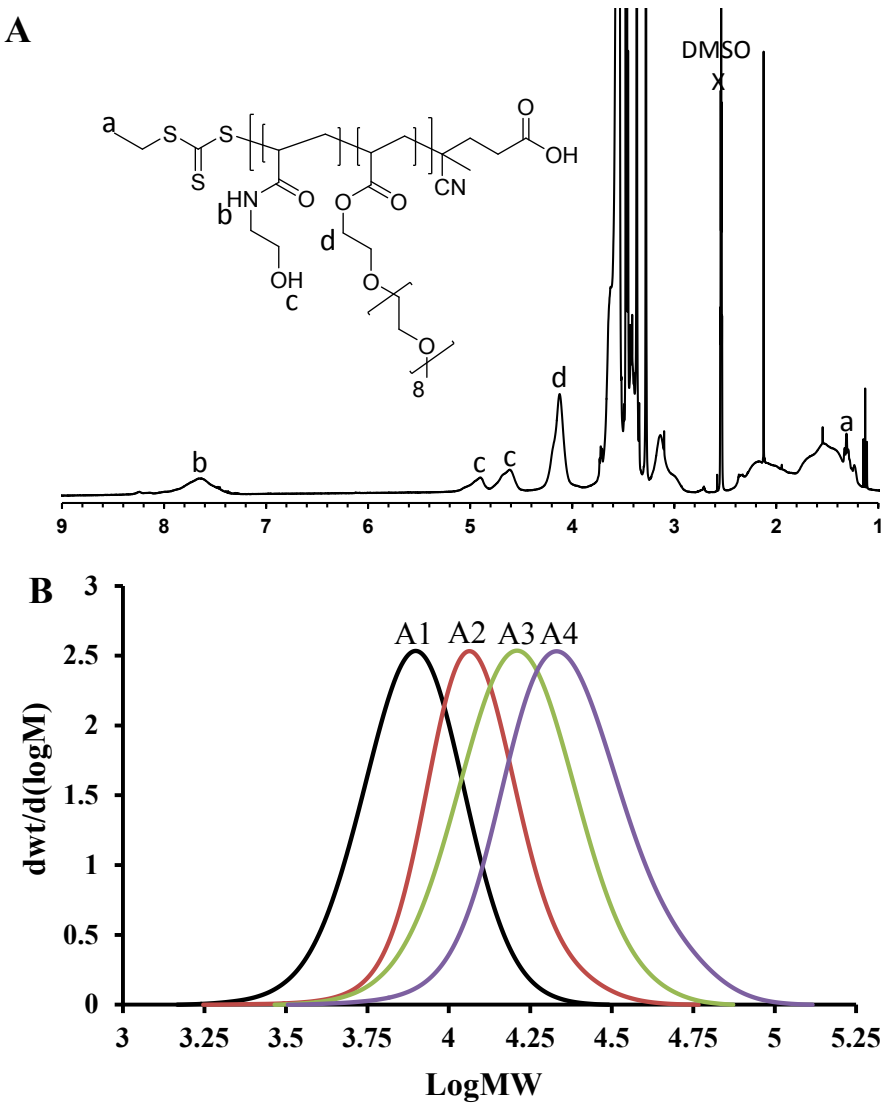

Figure S1. (A) ^{1}H NMR of macro-CTA A2 in DMSO-d_6, and (B) molecular weight distribution of P(PEGA-co-HEAA)-SC(=S)SC_2H_5 macro-CTAs with different molecular weight (A1-A4) polymerized at 60 °C in DMSO for 7 h using ACPA as an initiator. The intensities for different distribution curves were normalized.

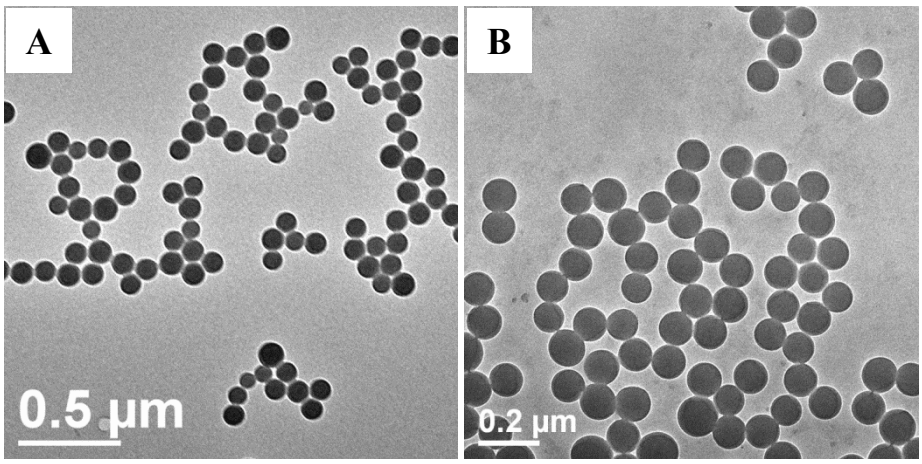

Figure S2. TEM images of particles formed by RAFT-mediated emulsion polymerization of styrene in water at 80 °C for 6 h using P($PEGA_{21}$-co-$HEAA_{21}$)-$SC(=S)SC_2H_5$ (A3) as macro-CTA and ACPA as an initiator: (A) Reaction 1: [Styrene]:[A3]:[I] = 2,790:1:0.3, and (B) Reaction 2: [Styrene]:[A3]:[I] = 5,253:1:0.3.

Figure S3. Molecular weight distribution for the RAFT-mediated emulsion polymerization of styrene in water at 80 °C for 6 h using P($PEGA_{21}$-co-$HEAA_{21}$)-SC(=S)SC_2H_5 (A3) as macro-CTA and ACPA as an initiator: (A) Reaction 1: [Styrene]:[A3]:[I] = 2,790:1:0.3, (B) Reaction 2: [Styrene]:[A3]:[I] = 5,253:1:0.3, and (C) Reaction 3: [Styrene]:[A3]:[I] = 11,907:1:0.3.

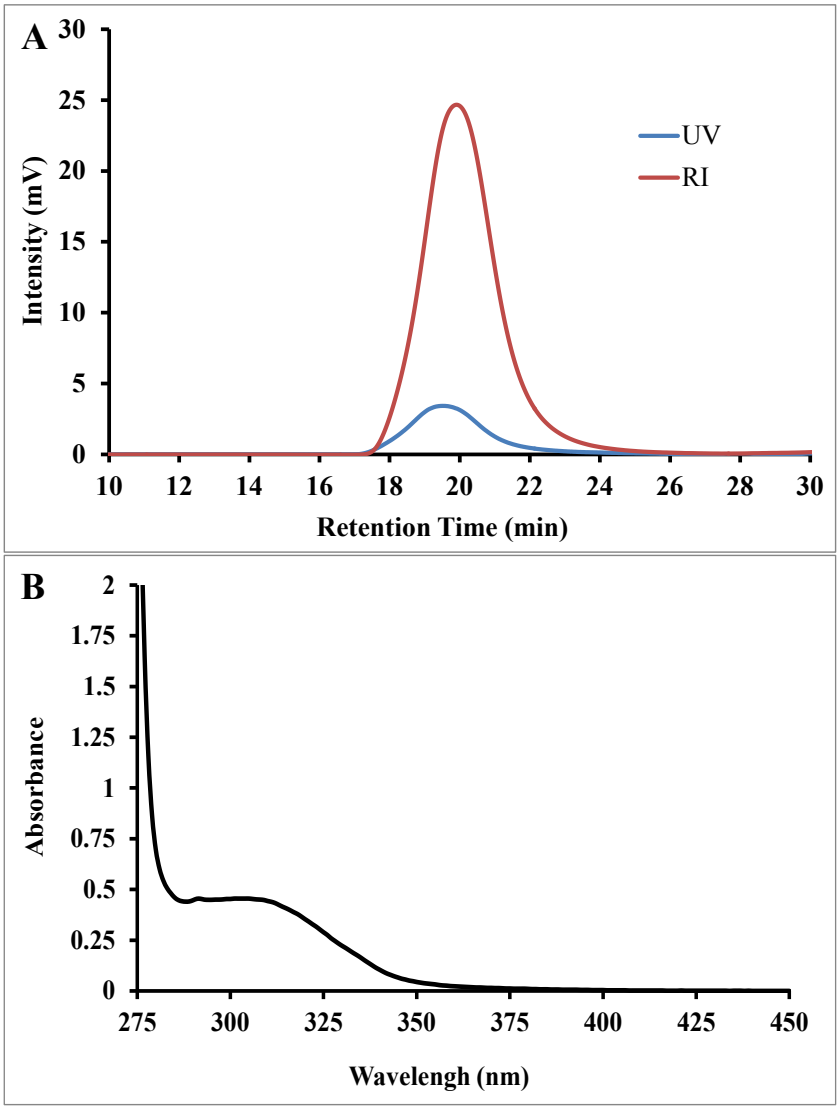

Figure S4. (A) RI and UV vs. retention time and (B) UV-vis spectrum of the product polymer for the RAFT-mediated emulsion polymerization of styrene in water at 80 °C for 6 h using P(PEGA$_{26}$-co-HEAA$_{25}$)-SC(=S)SC$_2$H$_5$ (A4) as macro-CTA and ACPA as initiator.

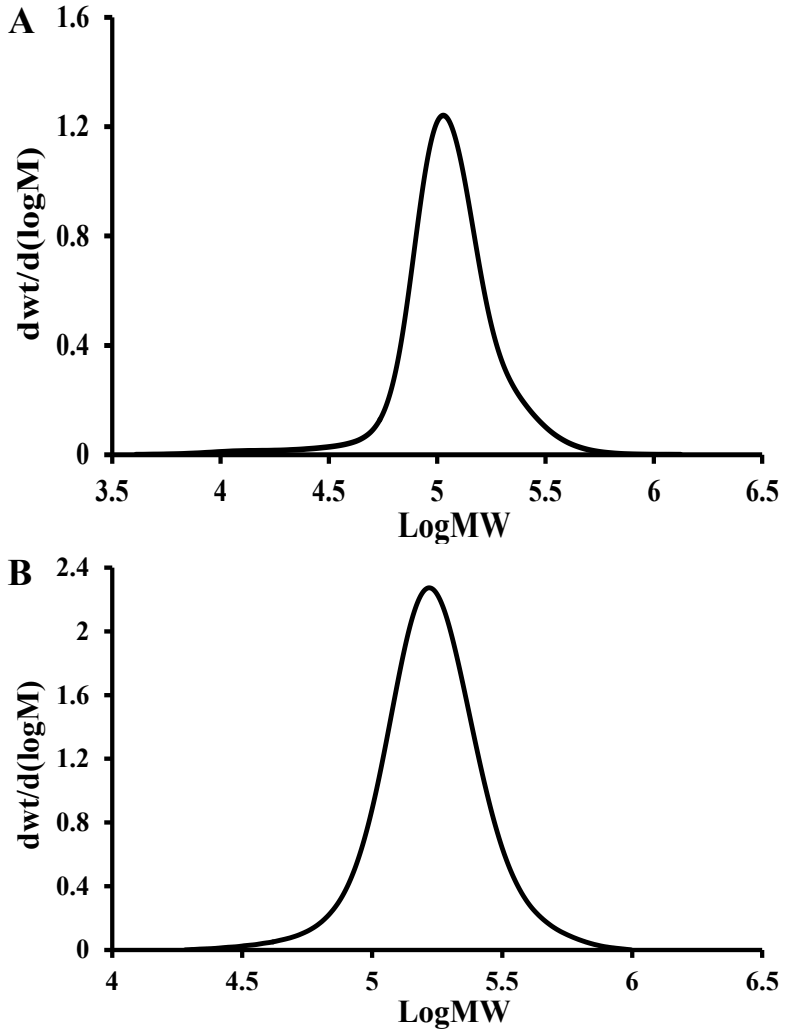

Figure S5. Molecular weight distributions for the RAFT-mediated emulsion polymerization of styrene in water at 80 °C for 6 h using ACPA as initiator and (A) P($PEGA_{15}$-co-$HEAA_{15}$)-$SC(=S)SC_2H_5$ (A2) and (B) P($PEGA_7$-co-$HEAA_7$)-$SC(=S)SC_2H_5$ (A1) as macro-CTAs.