

## Electronic Supplementary Information

# Use of a Switchable Hydrophobic Associative Polymer to Create an Aqueous Solution of CO<sub>2</sub>-Switchable Viscosity

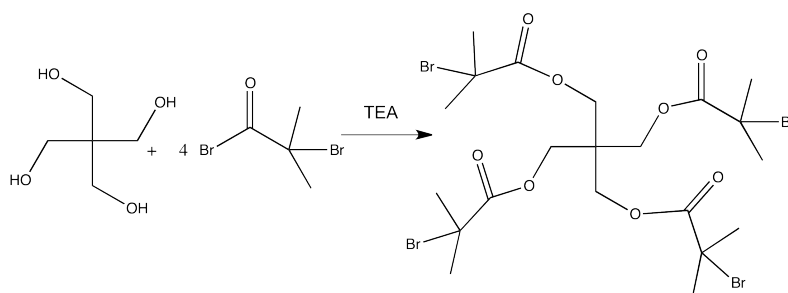
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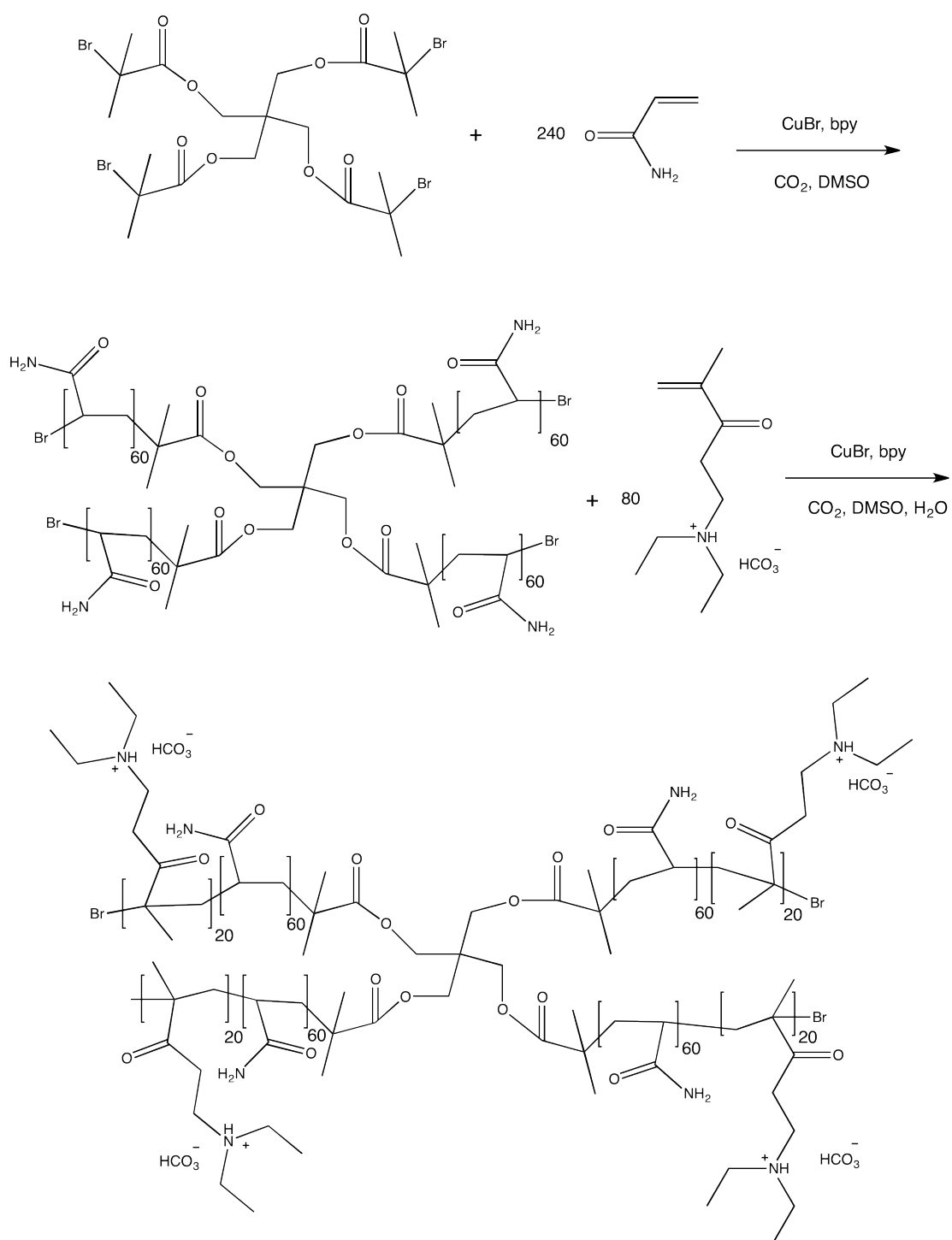
Fax: +1-613-533-6669; Phone: +1-613-533-3212; E-mail: [jessop@chem.queensu.ca](mailto:jessop@chem.queensu.ca).

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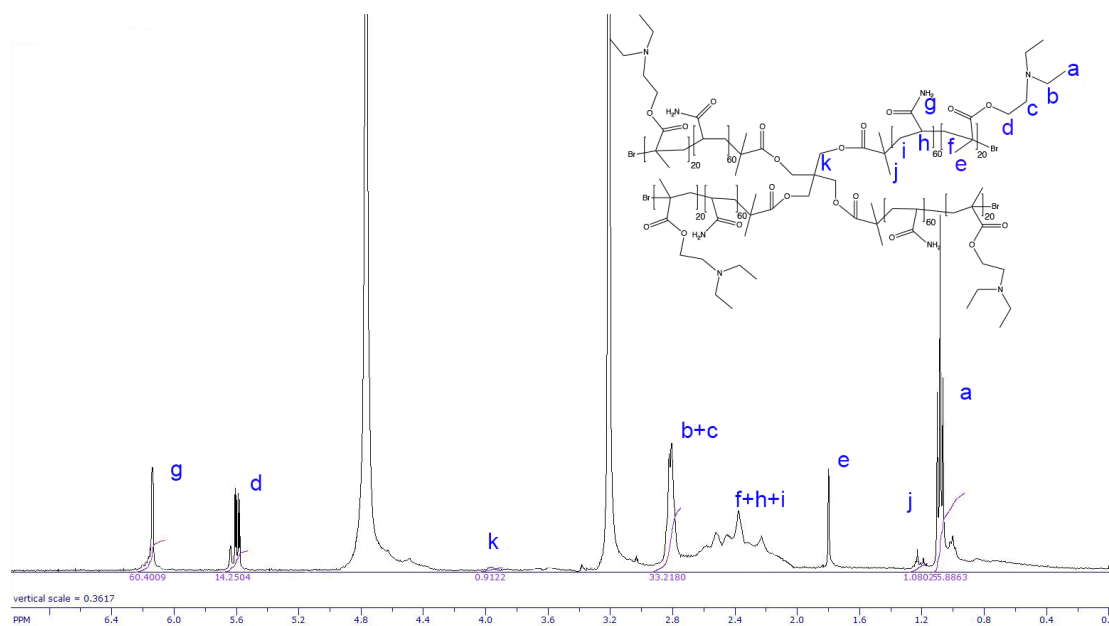
Fax: +1-613-533-6637; Tel: +1-613-533-2782; E-mail: [michael.cunningham@chee.queensu.ca](mailto:michael.cunningham@chee.queensu.ca).



**Fig. S1** Synthesis of the four-armed initiator

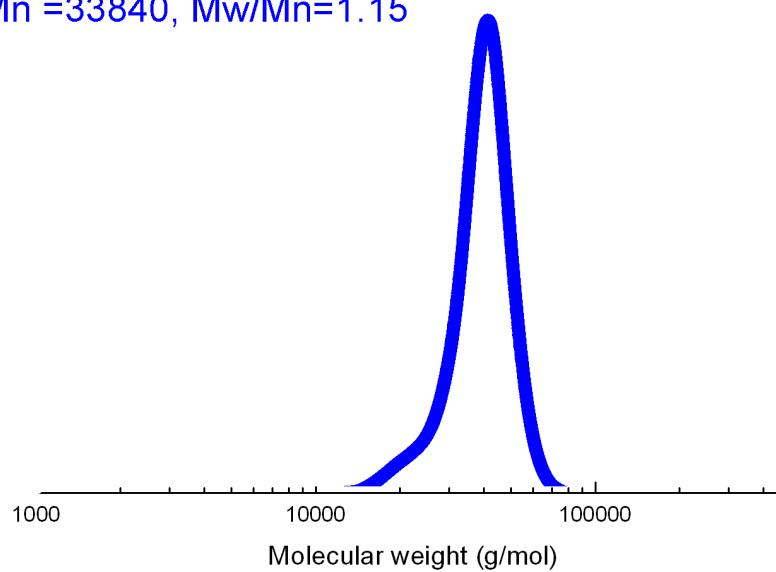


**Fig. S2** Synthesis of the four-armed copolymer  $(\text{PAM}_{60}\text{-PDEAEMA}_{20})_4$

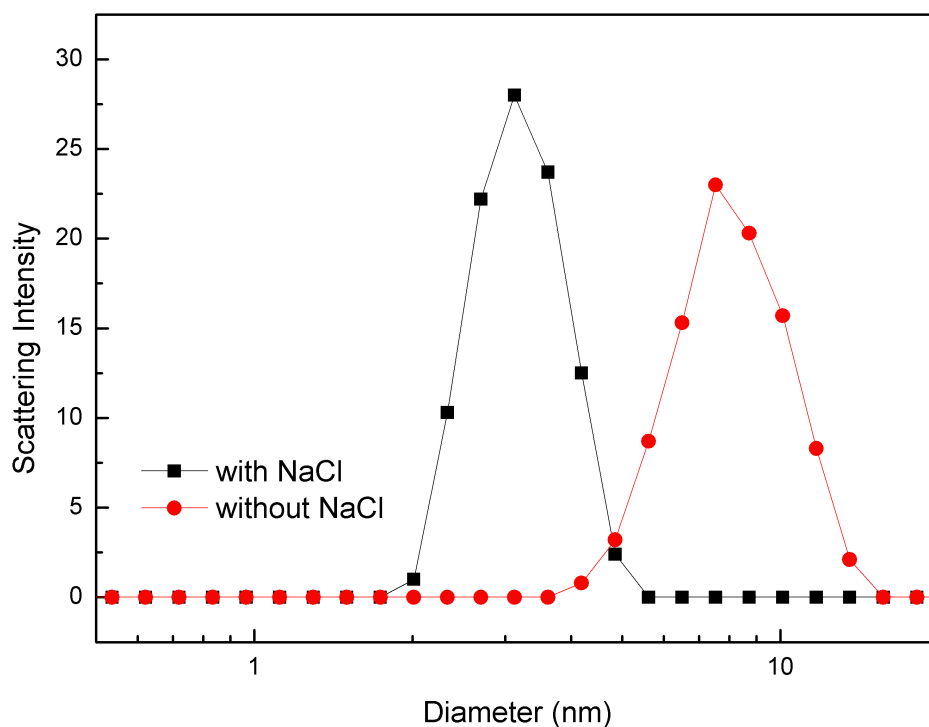


**Fig. S3**  $^1\text{H}$  NMR of the four-armed copolymer  $(\text{PAM}_{60}\text{-PDEAEMA}_{20})_4$

$M_n = 33840$ ,  $M_w/M_n = 1.15$



**Fig. S4**  $^1\text{H}$  NMR of the four-armed copolymer  $(\text{PAM}_{60}\text{-PDEAEMA}_{20})_4$



**Fig. S5** The particle size of (PAM<sub>60</sub>-PDEAEMA<sub>20</sub>)<sub>4</sub> at 25 °C with CO<sub>2</sub> (after bubbling 30 min), with or without 1.5 wt% NaCl. .

Fig. S5 demonstrates that the addition of salt NaCl decreases the particle size of (PAM<sub>60</sub>-PDEAEMA<sub>20</sub>)<sub>4</sub> with CO<sub>2</sub>, providing direct evidence of the polyelectrolyte effect.

A video showing low and high viscosity solutions is also available for download ("switchable viscosity polymer.wmv").