

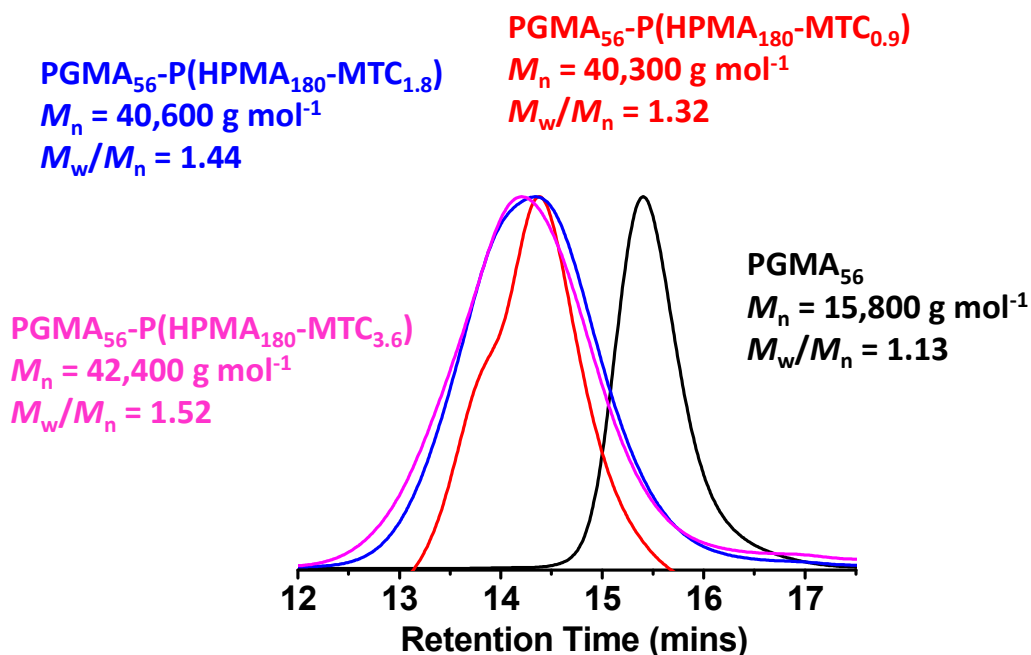
## Supporting Information for:

### Inducing an order-order morphological transition via chemical degradation of amphiphilic diblock copolymer nano-objects

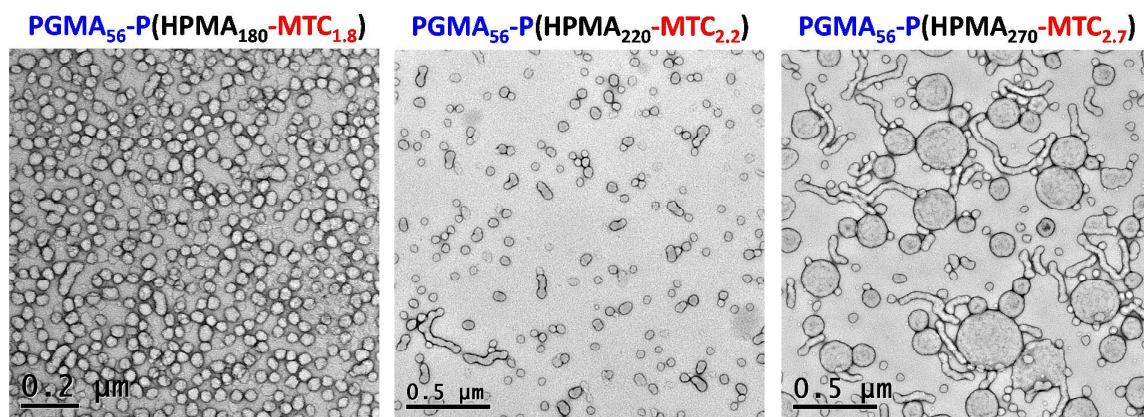
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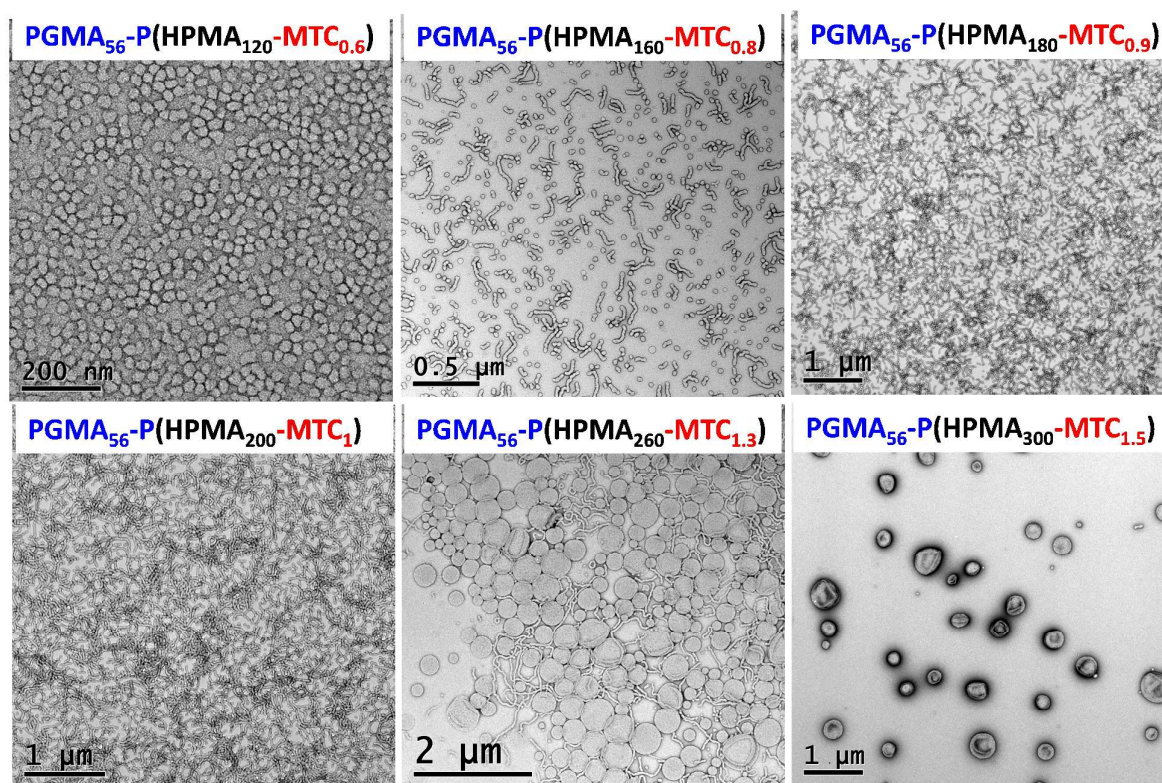
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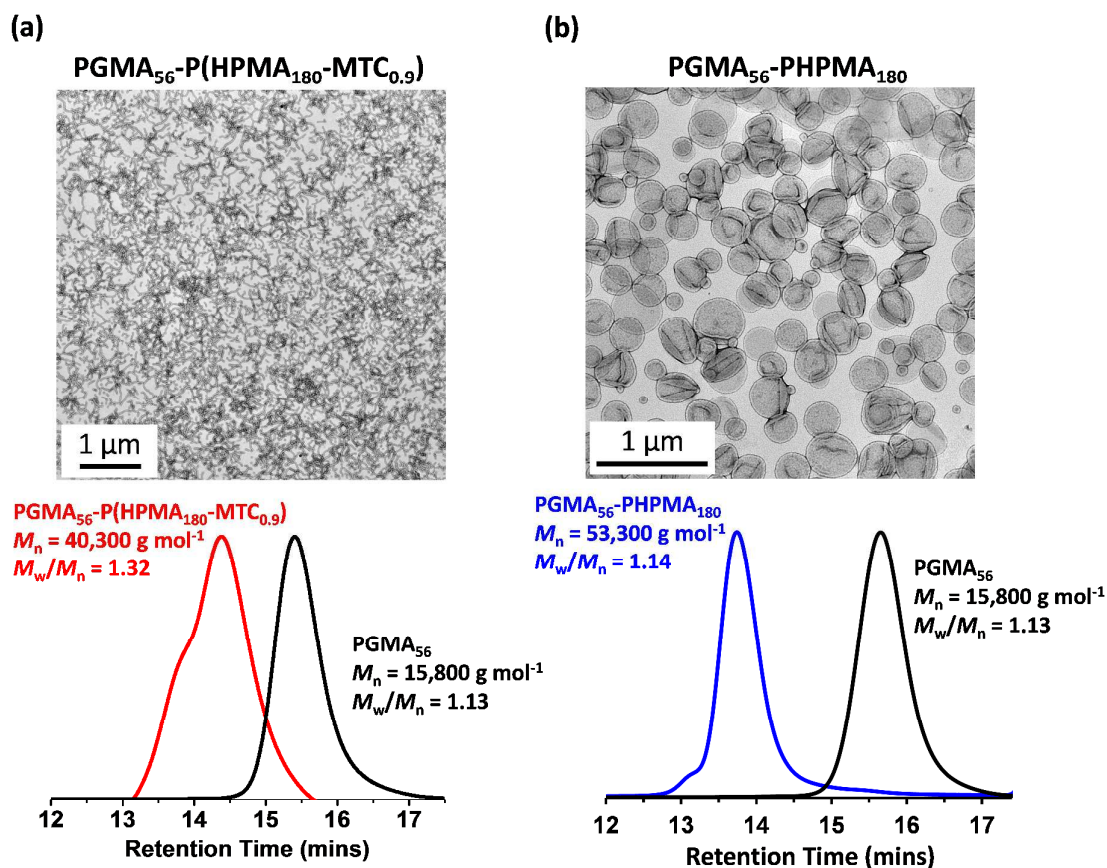
**Figure S1.** DMF GPC traces for PGMA<sub>56</sub>-P(HPMA<sub>180</sub>-*stat*-MTC<sub>z</sub>) copolymers with 0.5, 1.0 and 2.0 mol % of MTC (relative to HPMA monomer). All copolymers were prepared *via* RAFT aqueous dispersion polymerization at 70 °C and 10 % w/w.



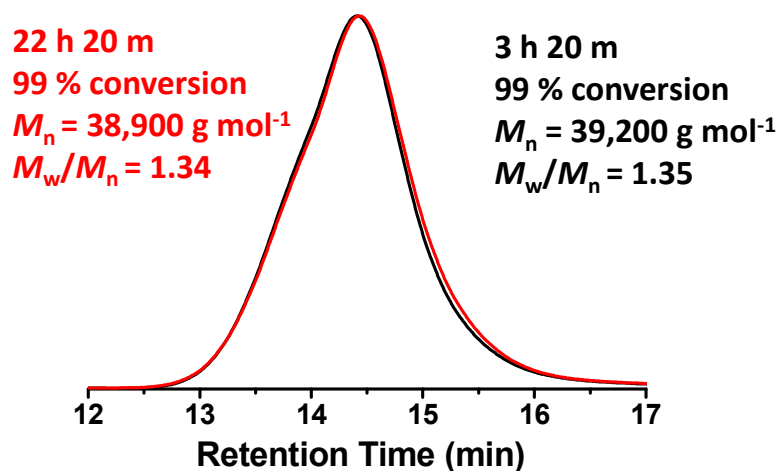
**Figure S2.** TEM images of 0.2 % w/w dispersions of PGMA<sub>x</sub>-P(HPMA<sub>y</sub>-stat-MTC<sub>z</sub>) copolymers prepared *via* RAFT aqueous dispersion polymerization at 70 °C and 10 % w/w with 1 mol % MTC relative to HPMA.



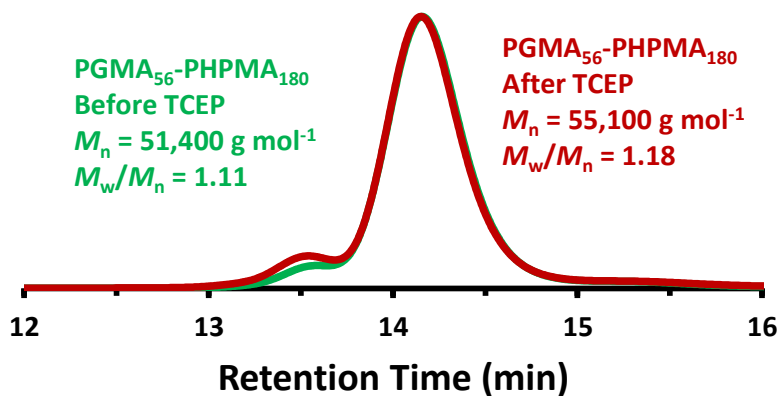
**Figure S3.** TEM images of 0.2 % w/w dispersions of PGMA<sub>x</sub>-P(HPMA<sub>y</sub>-stat-MTC<sub>z</sub>) copolymers prepared *via* RAFT aqueous dispersion polymerization at 70 °C and 10 % w/w with 0.5 mol % MTC relative to HPMA.



**Figure S4.** TEM images for 0.2 % w/w dispersions of (a) PGMA<sub>56</sub>-P(HPMA<sub>180</sub>-*stat*-MTC<sub>0.9</sub>) and (b) PGMA<sub>56</sub>-PHPMA<sub>180</sub> copolymers prepared *via* RAFT aqueous dispersion polymerization at 70 °C and 10 % w/w. DMF GPC traces for both copolymers and the PGMA<sub>56</sub> macro-CTA are also shown.

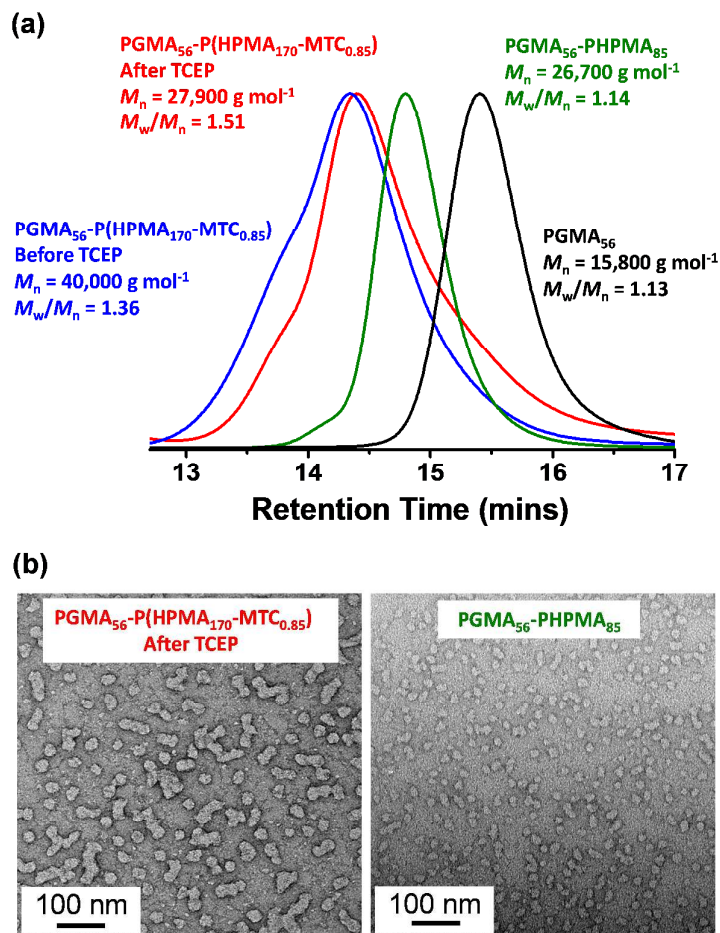


**Figure S5.** DMF GPC traces for a PGMA<sub>56</sub>-P(HPMA<sub>180</sub>-*stat*-MTC<sub>0.9</sub>) copolymer sampled at 3 h 20 m and 22 h 20 m prepared *via* RAFT aqueous dispersion polymerization at 70 °C and 10 % w/w.

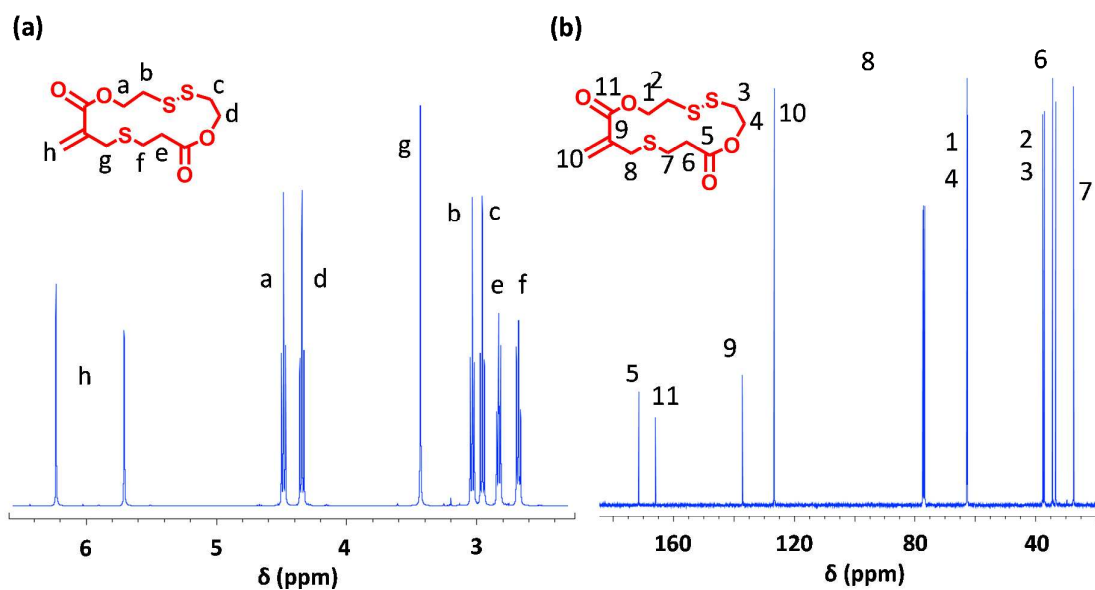


**Figure S6.** DMF GPC traces for a PGMA<sub>56</sub>-PHPMA<sub>180</sub> copolymer prepared *via* RAFT aqueous dispersion polymerization at 70 °C and 10 % w/w before and 1 day after the addition of 5 equivalents of TCEP (relative to the MTC monomer) to the 10 % w/w dispersion.





**Figure S7.** (a) DMF GPC curves recorded for PGMA<sub>56</sub>-P(HPMA<sub>170</sub>-stat-MTC<sub>0.85</sub>) copolymers prepared *via* RAFT copolymerization of MTC with HPMA using a PGMA<sub>56</sub> macro-CTA at 70 °C and 10 % w/w solids, before and after exposure to TCEP (TCEP/MTC molar ratio = 5.0) at pH 8-9 for 8 days at 20 °C. A PGMA<sub>56</sub>-PHPMA<sub>85</sub> copolymer is shown for comparison with the MTC containing copolymer after TCEP cleavage. (b) TEM images obtained for a 0.20 % w/w aqueous dispersion of PGMA<sub>56</sub>-P(HPMA<sub>170</sub>-stat-MTC<sub>0.85</sub>) after exposure to TCEP (TCEP/MTC molar ratio = 5.0) at pH 8-9 for 8 days at 20 °C and the PGMA<sub>56</sub>-PHPMA<sub>85</sub> copolymer.



**Figure S8.** (a)  $^1\text{H}$  NMR and (b)  $^{13}\text{C}$  NMR spectra for MTC monomer recorded using a 400 MHz Bruker Avance-400 spectrometer (64 scans per sample) in  $\text{CDCl}_3$ .

## References

- (1) Paulusse, J. M. J.; Amir, R. J.; Evans, R. A.; Hawker, C. J. *J. Am. Chem. Soc.* **2009**, *131*, 9805-9812.