Supplementary Materials: Acid-Labile Surfactants Based on Poly(ethylene glycol), Carbon Dioxide and Propylene Oxide: Miniemulsion Polymerization and Degradation Studies

Markus Scharfenberg, Sarah Wald, Frederik R. Wurm and Holger Frey



Figure S1. ¹H NMR spectrum of mPEG₁₁₃-*b*-PPC₄₉ (Table 1, sample 3) (400 MHz, CD₃CN).



Figure S2. ¹³C NMR spectrum of mPEG₁₁₃-*b*-PPC₄₉ (Table 1, sample 3) (100 MHz, CD₃CN).



Figure S3. SEC traces of all mPEG₁₁₃-*b*-PPC AB-diblock copolymer surfactants (Table 1, sample 1–3) in comparison with the mPEG₁₁₃ initiator using DMF as an eluent and PEG calibration.



Figure S4. SEC traces of all mPEG₄₅-*b*-PPC AB-diblock copolymer surfactants (Table 1, sample 4–8) in comparison with the mPEG₄₅ initiator using DMF as an eluent and PEG calibration.



Figure S5. SEC traces of all PPC-*b*-PEG₄₅-*b*-PPC ABA-triblock copolymer surfactants (Table 1, sample 9,10) in comparison with the PEG₄₅ initiator using DMF as an eluent and PEG calibration.



Figure S6. Surface tension measurements of an aqueous solution of mPEG₁₁₃-*b*-PPC₄₉ (Table 1, sample 3) for the determination of the CMC.



Figure S7. Degradation reaction of mPEG₁₁₃-*b*-PPC₄₉ (Table 1, sample 3) in aqueous hydrochloric solution (pH 1) after 8 d and 26 d at RT, 50 °C and 70 °C, respectively.



Figure S8. Online ¹H NMR degradation study of mPEG₁₁₃-*b*-PPC₄₉ (Table 1, sample 3) in hydrochloric aqueous solution (pD 1). Comparison of all degradation products in units per mPEG₁₁₃ at different reaction temperatures (RT, 50 °C, 70 °C).



Figure S9. SEC traces of the degradation study of mPEG₁₁₃-*b*-PPC₄₉ (Table 1, sample 3) in hydrochloric aqueous solution (pH 1) at room temperature in comparison with the mPEG₁₁₃ initiator using DMF as an eluent and PEG calibration.



Figure S10. SEC traces of the degradation study of mPEG₁₁₃-*b*-PPC₄₉ (Table 1, sample 3) in hydrochloric aqueous solution (pH 1) at 50 °C in comparison with the mPEG₁₁₃ initiator using DMF as an eluent and PEG calibration.



Figure S11. SEC traces of the degradation study of mPEG₁₁₃-*b*-PPC₄₉ (Table 1, sample 3) in hydrochloric aqueous solution (pH 1) at 70 °C in comparison with the mPEG₁₁₃ initiator using DMF as an eluent and PEG calibration.



Figure S12. SEM image of the synthesized PS nanoparticles (NP2, NP4 and NP6). Scale bar = $1 \mu m$.



Figure S13. Picture of a stable aqueous nanoparticle dispersion with LutAT50 as a surfactant before (left) and after (right) the treatment with conc. HCl solution (36 h).