Supporting Information For:

Microgel colloidosomes based on pH-responsive poly(*tert*-butylaminoethyl methacrylate) latexes

Andrew J. Morse, Jeppe Madsen, David J. Growney, Steven P. Armes, Peter Mills and Ron Swart*

PTBAEMA latex synthesis details

PEGMA-stabilized poly(2-(tert-butylamino)ethyl methacrylate) latex synthesis via aqueous emulsion polymerization. PEGMA stabilizer (1.00 g of a 50 wt % aqueous solution) was weighed into a 100 mL two-neck round-bottomed flask equipped with a magnetic follower. Deionized water (40.0 g) was added, followed by TBAEMA "head monomer" (0.50 g) and the initial solution pH was recorded. This emulsion was purged with nitrogen gas for 15 min, then heated to 70 °C with the aid of an oil bath and stirred at 250 rpm using a magnetic follower. After 10 min APS initiator (2.0 wt % based on TBAEMA) dissolved in deionized water (5.0 g) was injected into the reaction vessel to commence the first-stage polymerization. After 1 h, further TBAEMA monomer (4.45 g) pre-mixed with DVB (0.05 g) was added dropwise (3.0 ml h^{-1}) using a syringe pump. The reaction mixture gradually turned milky-white within 30 minutes and was stirred at 70 °C for 24 h.

Figure S1. Representative scanning electron microscopy images obtained for PPG-TDI cross-linked colloidosomes prepared using; (a) 0.8 mol % DVB cross-linked PEGMA-PTBAEMA (entry 1, Table 1) and (b) 2.4 mol % DVB cross-linked PEGMA-PTBAEMA (entry 2, Table 1).

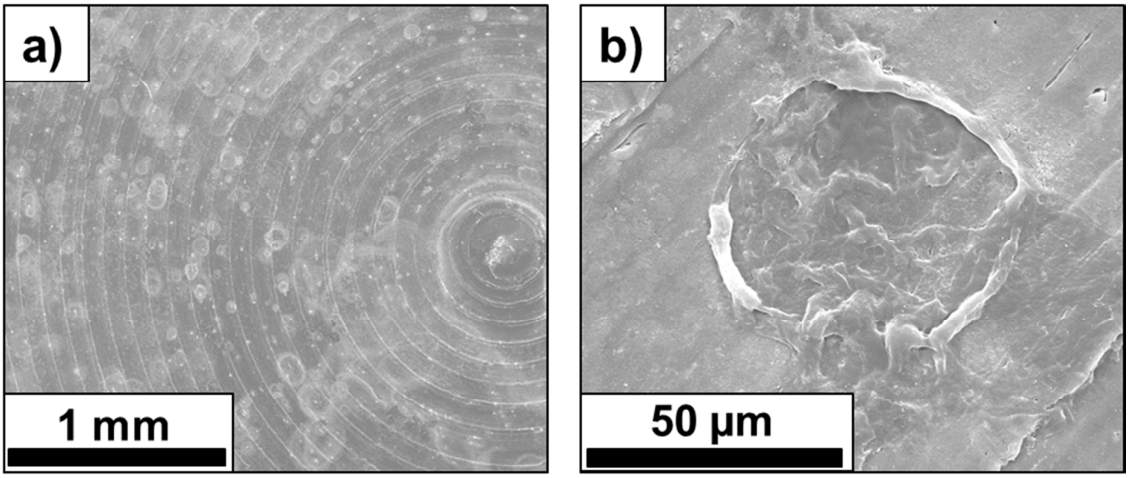

Figure S2. Representative TEM images recorded for PEGMA-P(TBAEMA/S) copolymer latexes with TBAEMA:S initial molar ratios of; 90:10 (a + b, entry 5, Table 1), 70:30 (c + d, entry 6, Table 1), 50:50 (e + f, entry 7, Table 1) and 40:60 (g + h, entry 8, Table 1).

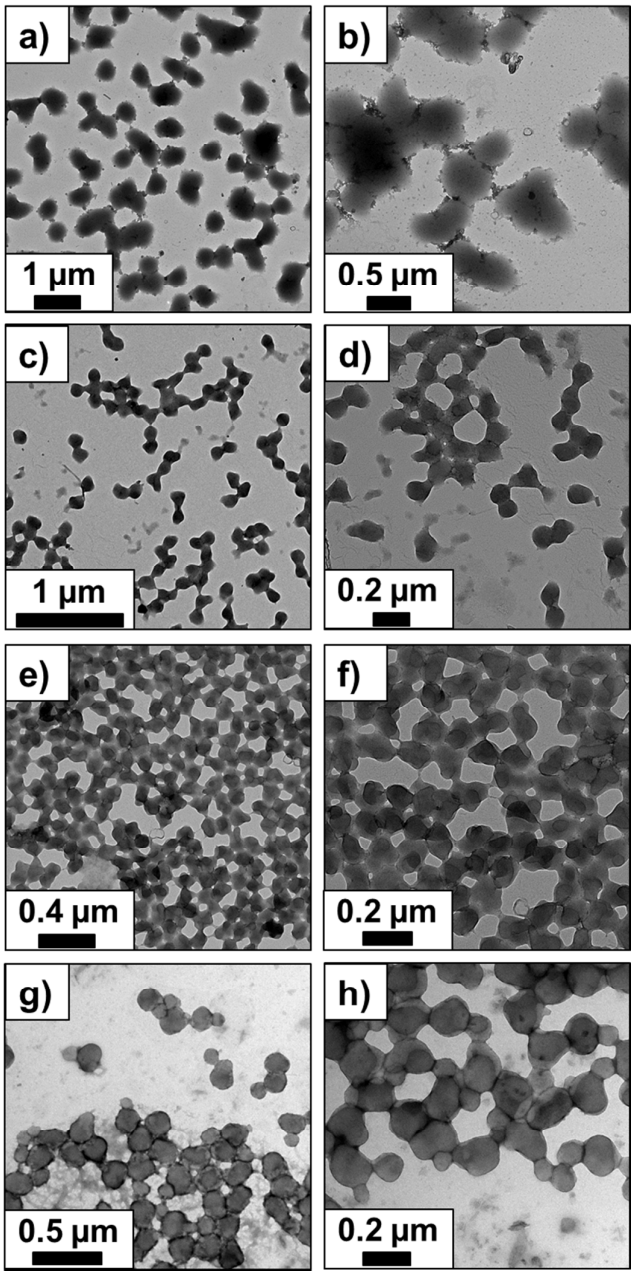

Figure S3. Optical microscopy images recorded after an ethanol challenge of covalently cross-linked colloidosomes prepared using (a) PEGMA-P(TBAEMA/S) latex (50:50 TBAEMA:S molar ratio, entry 7, Table 1) and (b) PEGMA-P(TBAEMA/S) latex (40:60 TBAEMA:S molar ratio, entry 8, Table 1).