Electronic Supplementary Material (ESI) for Soft Matter.

ESI

EMULSION STABILISATION BY COMPLEXES OF OPPOSITELY CHARGED SYNTHETIC POLYELECTROLYTES

Ana Maria Bago Rodriguez,[1] Bernard P. Binks[1,*] and Tomoko Sekine[2]

[1] *School of Mathematics and Physical Sciences, University of Hull, Hull, HU6 7RX, UK*

[2] *Shiseido Global Innovation Center, 2-2-1 Hayabuchi, Tsuzuki-ku, Yokohama 224-8558, Japan*

Figure S1. Potentiometric titration of a 1 g L^{-1} PAANa solution against 0.1 M HCl (open points). The pH of the initial PAANa solution was increased to ≈ 11.5 with NaOH to evaluate the full pH range. The curve that connects the filled points corresponds to the derivative of the pH as a function of the volume of titrating agent (dpH/dV). Inset plot: degree of ionisation *versus* pH obtained from the titration curve.

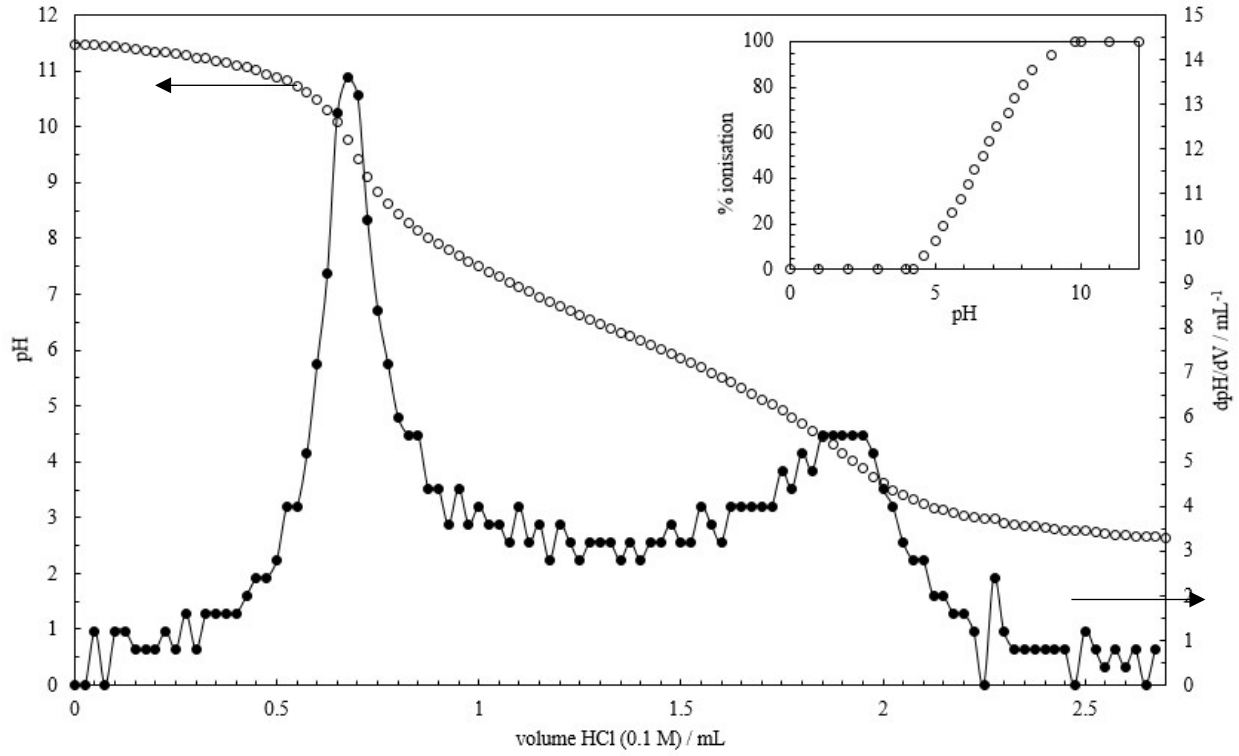

Figure S2. Variation of the average particle diameter with x_{PAANa} for aqueous PEC dispersions prepared from 0.1 g L^{-1} individual PEL solutions at different pH.

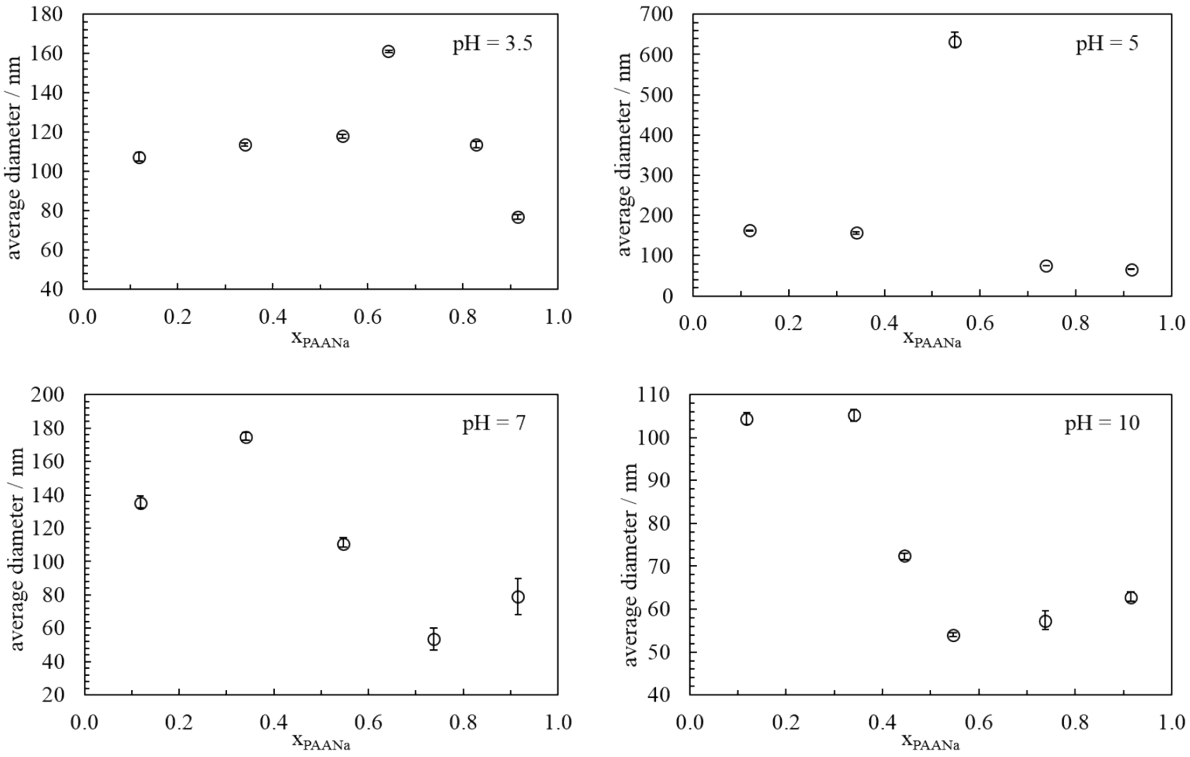

Figure S3. Variation of (a) average diameter and (b) zeta potential *versus* charge ratio $Z_{-/+}$ for aqueous PEC dispersions prepared from 0.1 g L^{-1} individual PEL solutions at three extents of ionisation of PAANa calculated according to ref. 32.

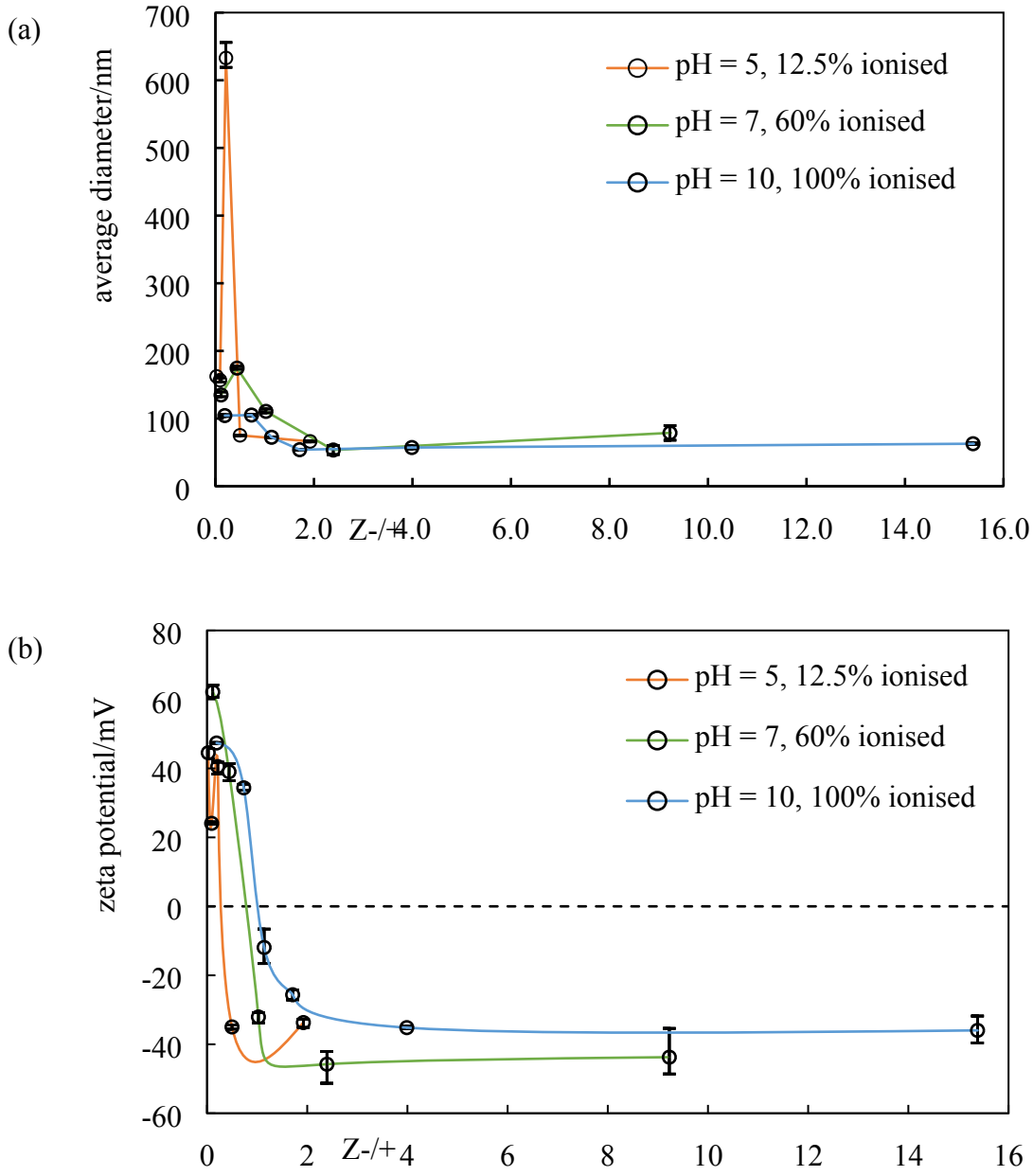

Figure S4. Appearance of fresh aqueous PEC dispersions prepared from 5 g L^{-1} PEL solutions at (a) pH = 2 and (b) pH = 6 at different x_{PAANa} (given). Scale bars = 1 cm. Optical microscope image of a drop of dispersion at (c) pH = 2, x_{PAANa} = 0.57 or (d) pH = 6, x_{PAANa} = 0.57.

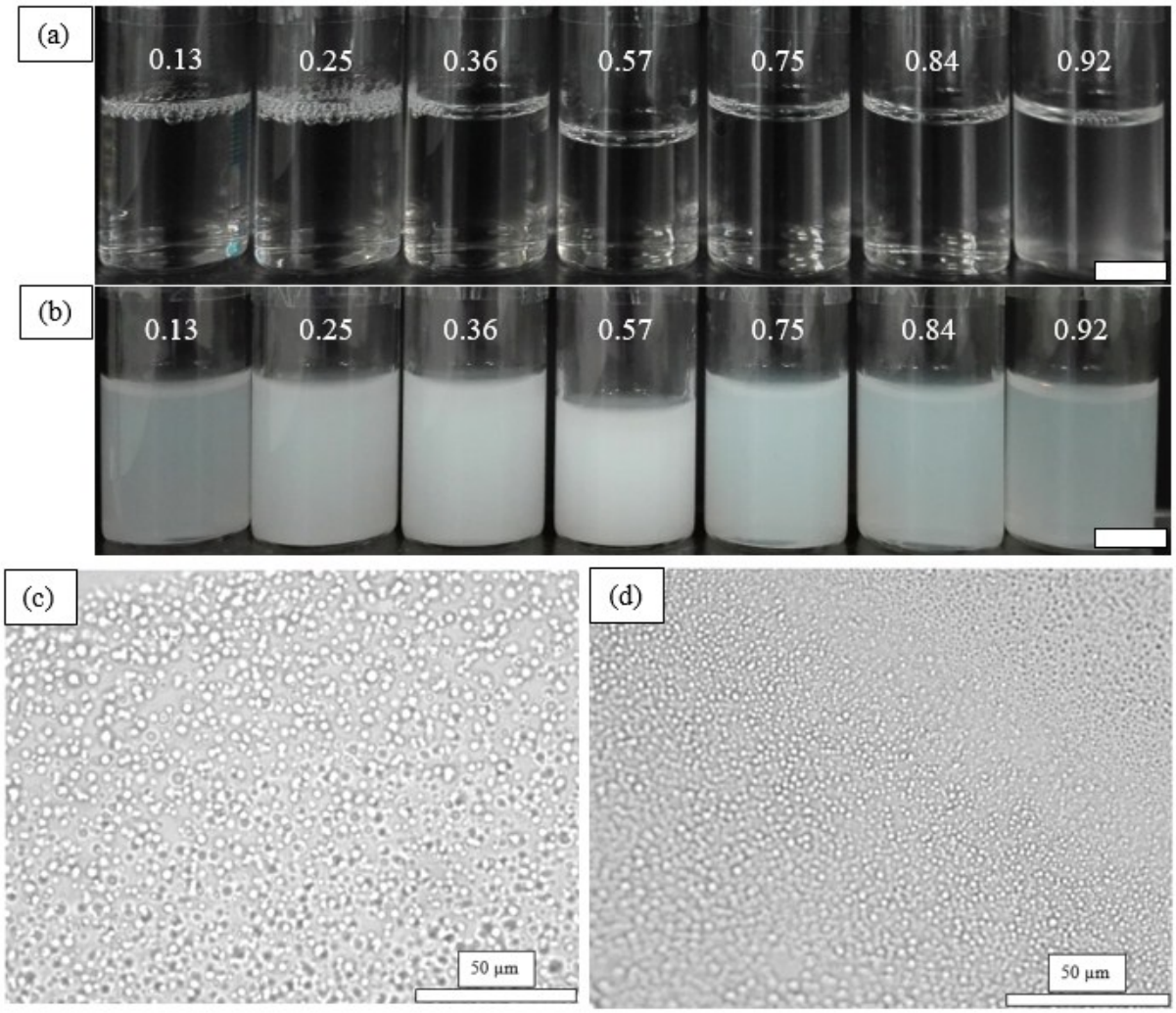

Figure S5. TEM images of the diluted freshly prepared aqueous PEC dispersion ($x_{PAANa} = 0.5$) prepared from 5 g L^{-1} PEL solutions at pH = 10 at different magnifications. The sample was negatively stained with uranyl acetate.

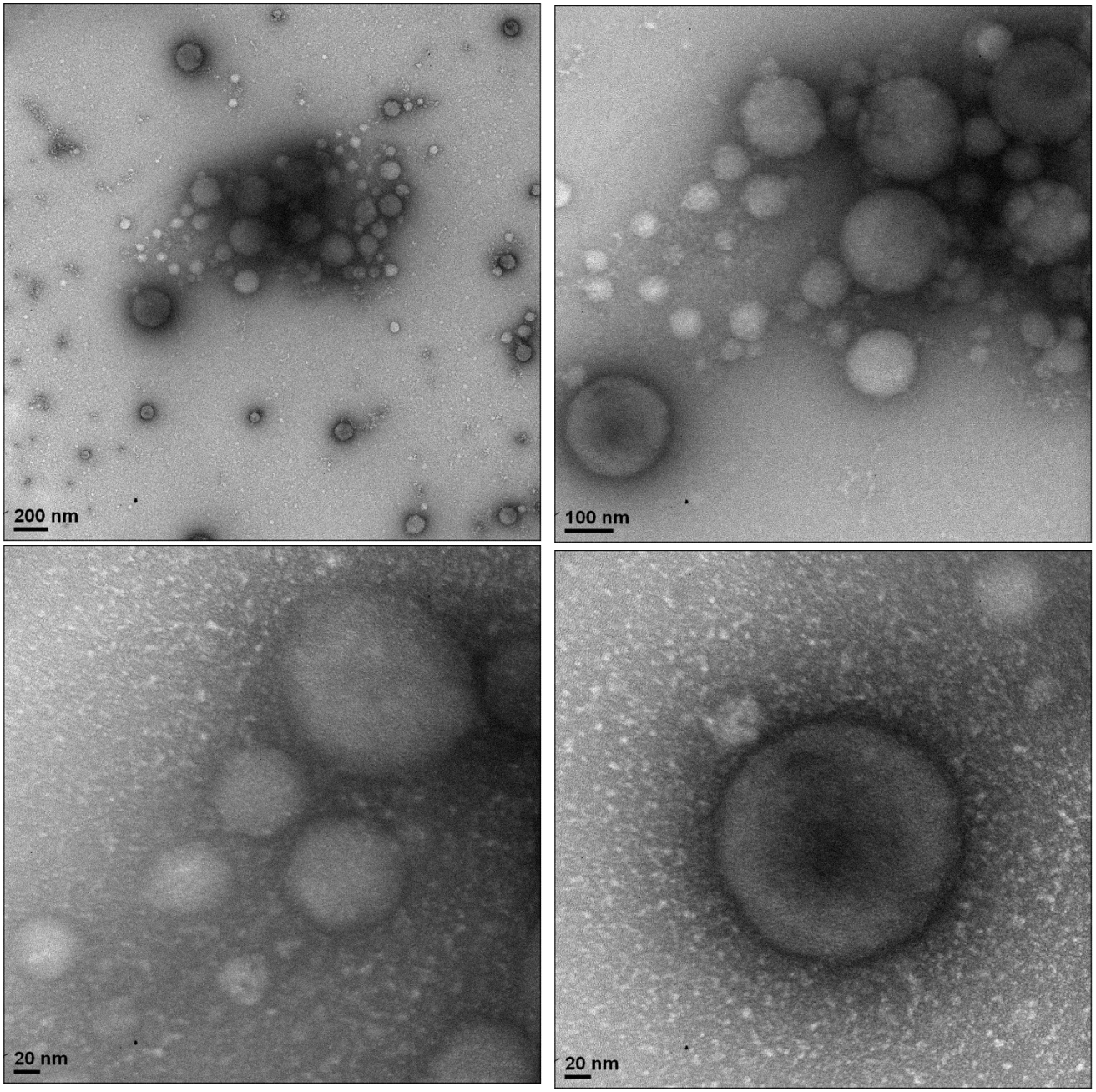

Figure S6. TEM images of aqueous PEC dispersion (x_{PAANa} = 0.5) prepared from 5 g L^{-1} PEL solutions at pH = 10 at different magnifications. First row - unstained sample, second row - negatively stained sample.

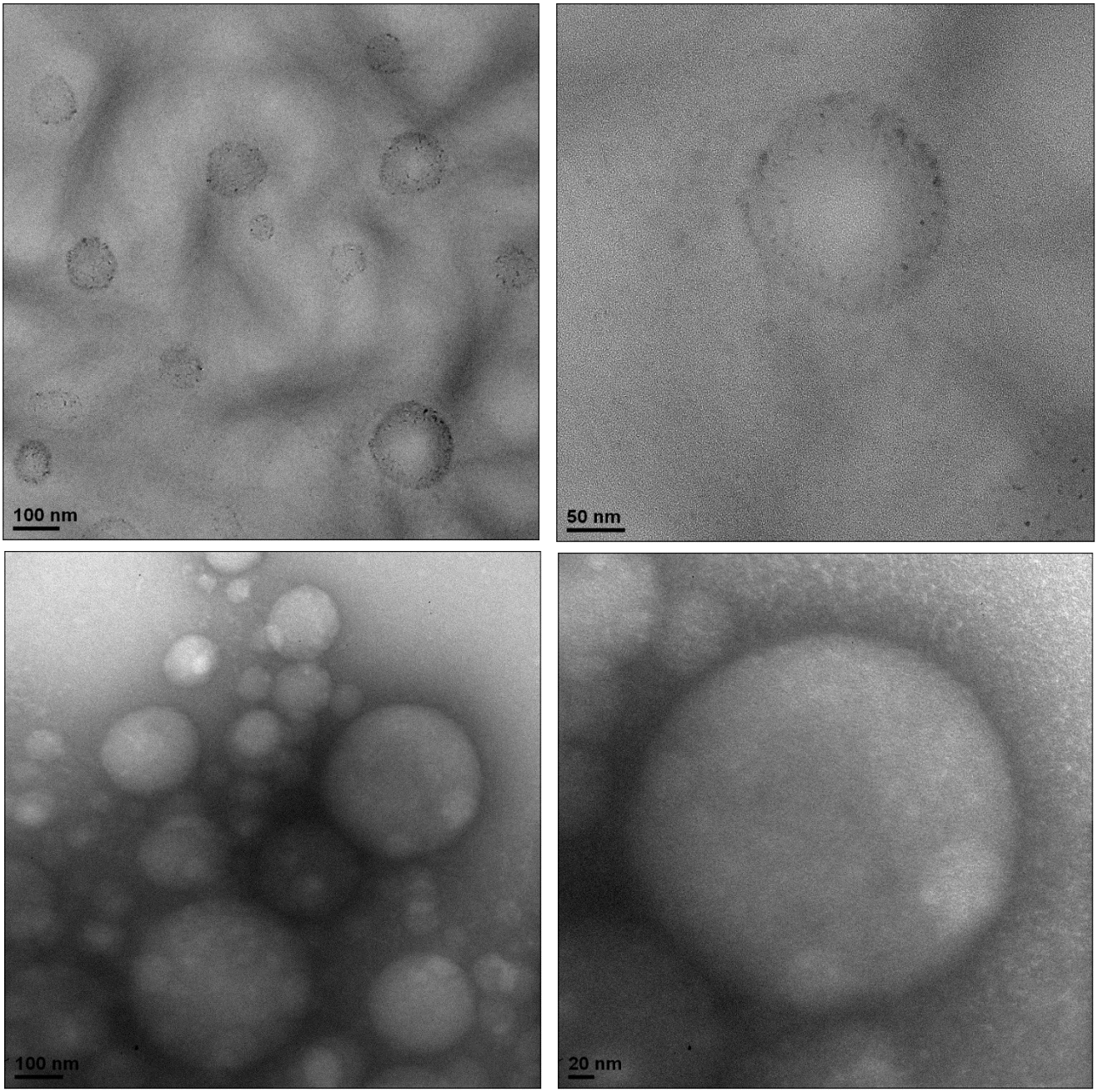

Figure S7. Appearance of dodecane-in-water emulsions (ϕ_o = 0.20 added in one step) from aqueous PEC dispersions ([PEL] = 5 g L^{-1}, $x_{PAANa} \approx 0.50$) at different pH (given). Appearance of the emulsions 11 days after preparation is also shown. Scale bar = 1 cm.

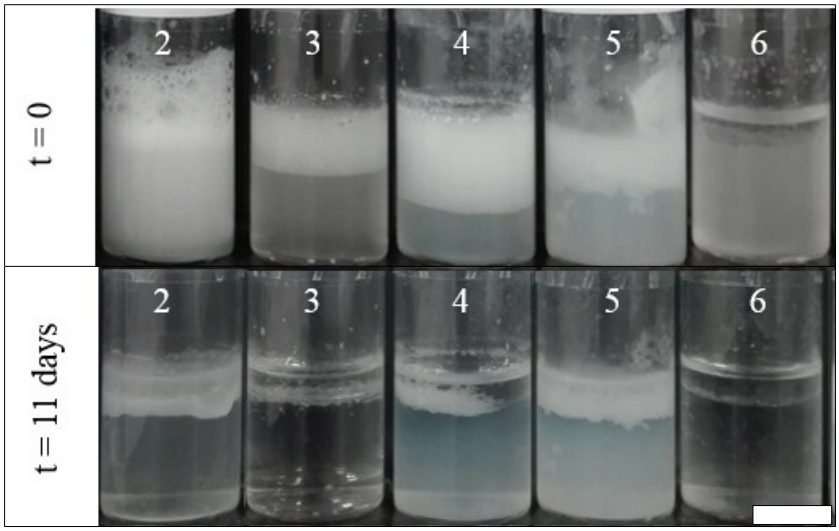

Figure S8. Appearance of dodecane-in-water emulsions (ϕ_o = 0.20 added in one step) stabilised by PAANa at pH = 2 and different concentrations (given in g L^{-1}) at various times. Scale bar equals to 1 cm.

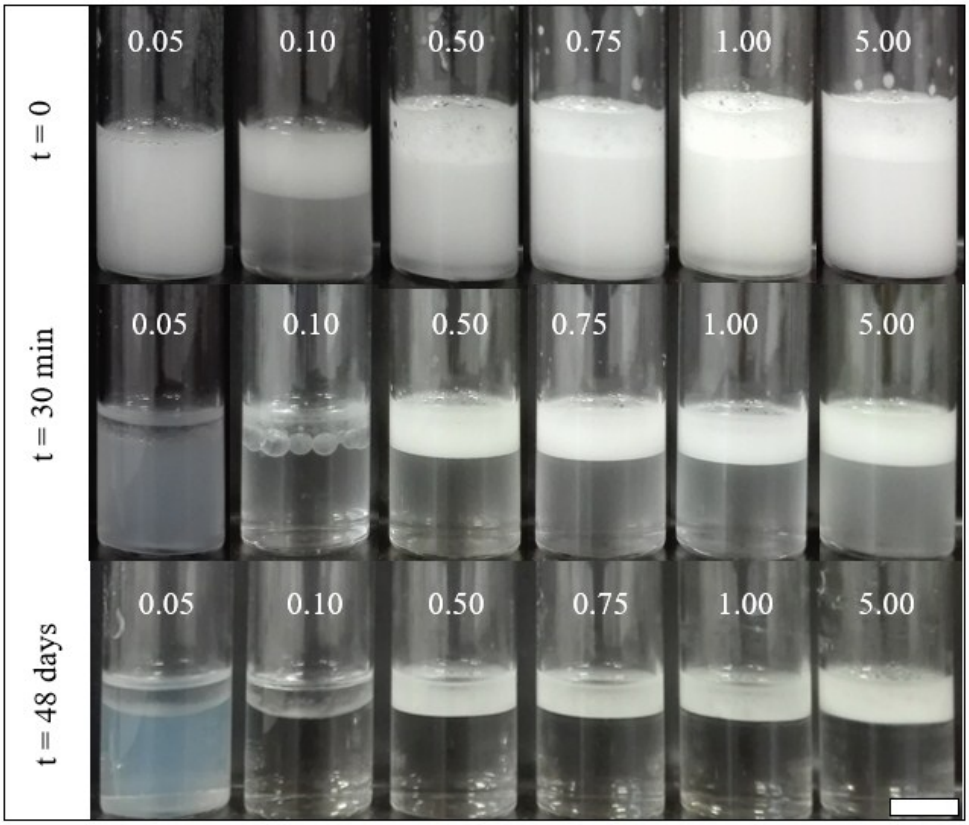

Figure S9. Appearance of emulsions immediately after homogenisation prepared with dodecane (ϕ_o = 0.2) and 5 g L^{-1} PEL solution at pH = 10 for PAANa and PDADMAC separately. Scale bar = 1 cm.

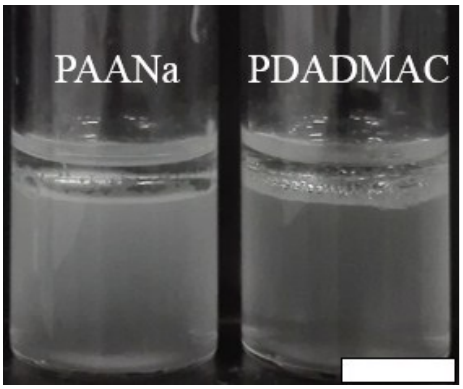

Figure S10. (a) Appearance of aqueous PEC dispersion prepared from 30 g L^{-1} PEL solutions at pH = 10, x_{PAANa} = 0.5. A white dispersion coexists with a viscous gelatinous phase as seen on the inverted vial. (b) Appearance of dodecane-in-water emulsion immediately after homogenisation (left, ϕ_o = 0.20 in one step); right - corresponds to the same vial after removal of the gelatinous phase on top. Scale bar = 1 cm. Optical microscope image of (c) white dispersion in (a), (d) gelatinous phase in (a), (e) aqueous dispersion separated after emulsification in (b).

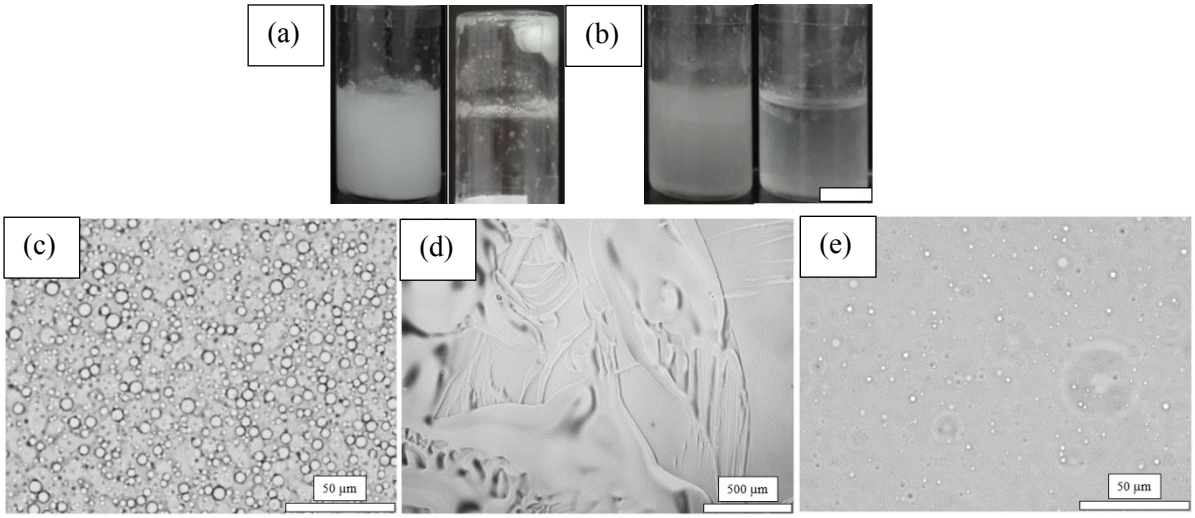

Figure S11. Appearance of o/w emulsion (ϕ_o = 0.20, added stepwise) with (a) isopropyl myristate and (b) squalane from aqueous PEC dispersion ([PEL] = 5 g L^{-1}, pH = 10, x_{PAANa} = 0.5) at different times. Scale bars = 1 cm.

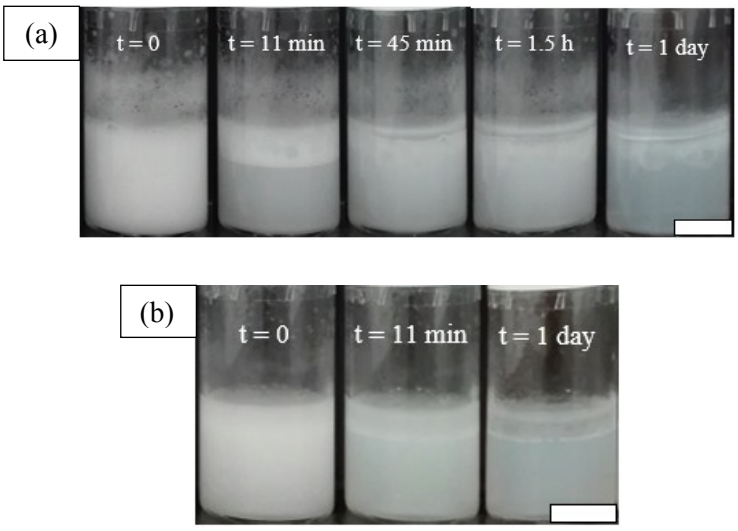

Figure S12. (a) Appearance of PDMS-in-water emulsion (ϕ_o = 0.20, added stepwise) from the aqueous PEC dispersion ([PEL] = 5 g L^{-1}, pH = 10, x_{PAANa} = 0.5) with time. Scale bar = 1 cm. (b) Optical microscope images of the above emulsion once creaming halted.

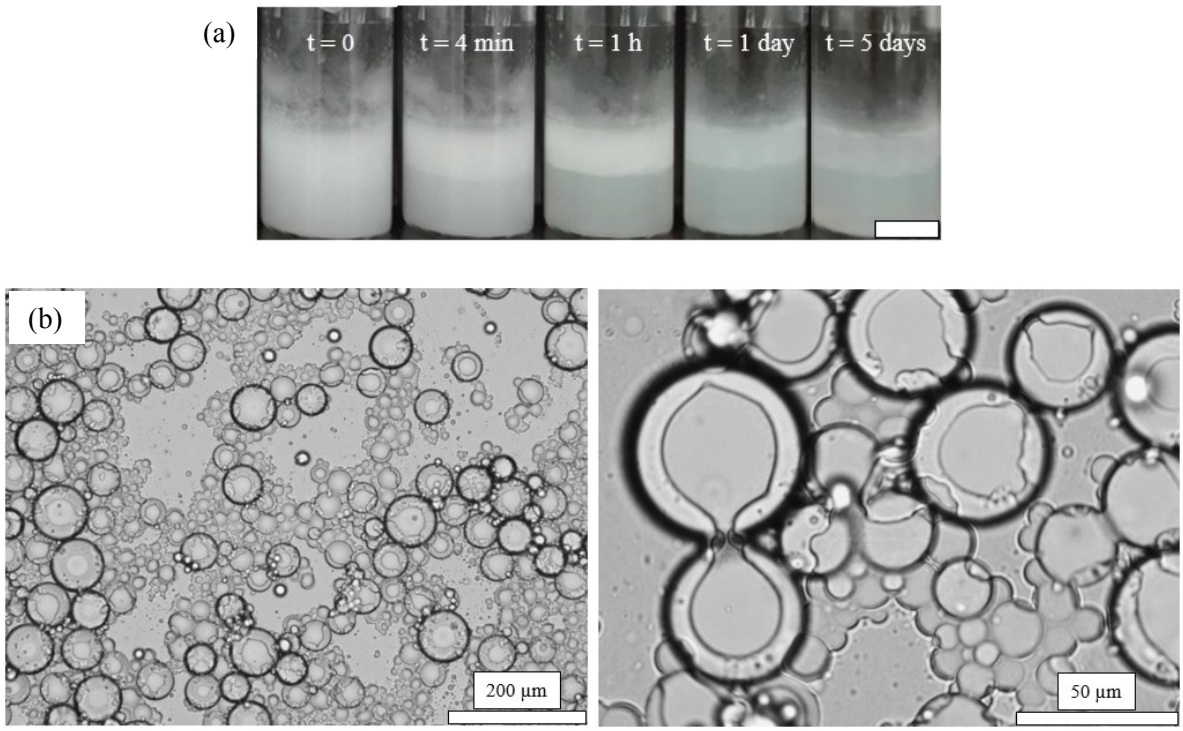

Figure S13. (a) Appearance of toluene-in-water emulsion (ϕ_o = 0.20, added stepwise) from aqueous PEC dispersion ([PEL] = 5 g L^{-1}, pH = 10, x_{PAANa} = 0.5) with time. Scale bar = 1 cm. (b) Optical microscope images of the above emulsion once creaming halted.