

Supplementary information file

For:

Lowest gelation concentration in a complex-coacervate driven self-
assembling system, achieved by redox-RAFT synthesis of high molecular
weight block polyelectrolytes

Aleksander Guzik^{a,b}, Fabrice de Maere d'Aertrycke^a, Marc C.A. Stuart^c and Patrizio Raffa^{a*}

a Smart and Sustainable Polymeric Products, Engineering and Technology Institute Groningen, University of Groningen, Nijenborgh 4 9747 AG, The Netherlands

b DPI, P.O. Box 902, 5600 AX Eindhoven, the Netherlands.

c Electron Microscopy, Groningen Biomolecular Sciences and Biotechnology Institute, University of Groningen, Nijenborgh 7, 9747 AG Groningen, The Netherlands

* corresponding author e-mail: p.raffa@rug.nl

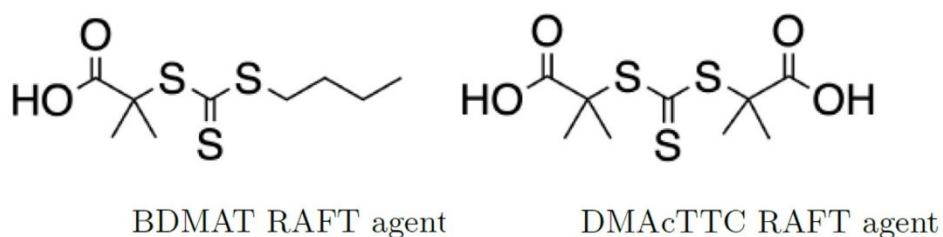


Figure S1 – structures of the RAFT agents used

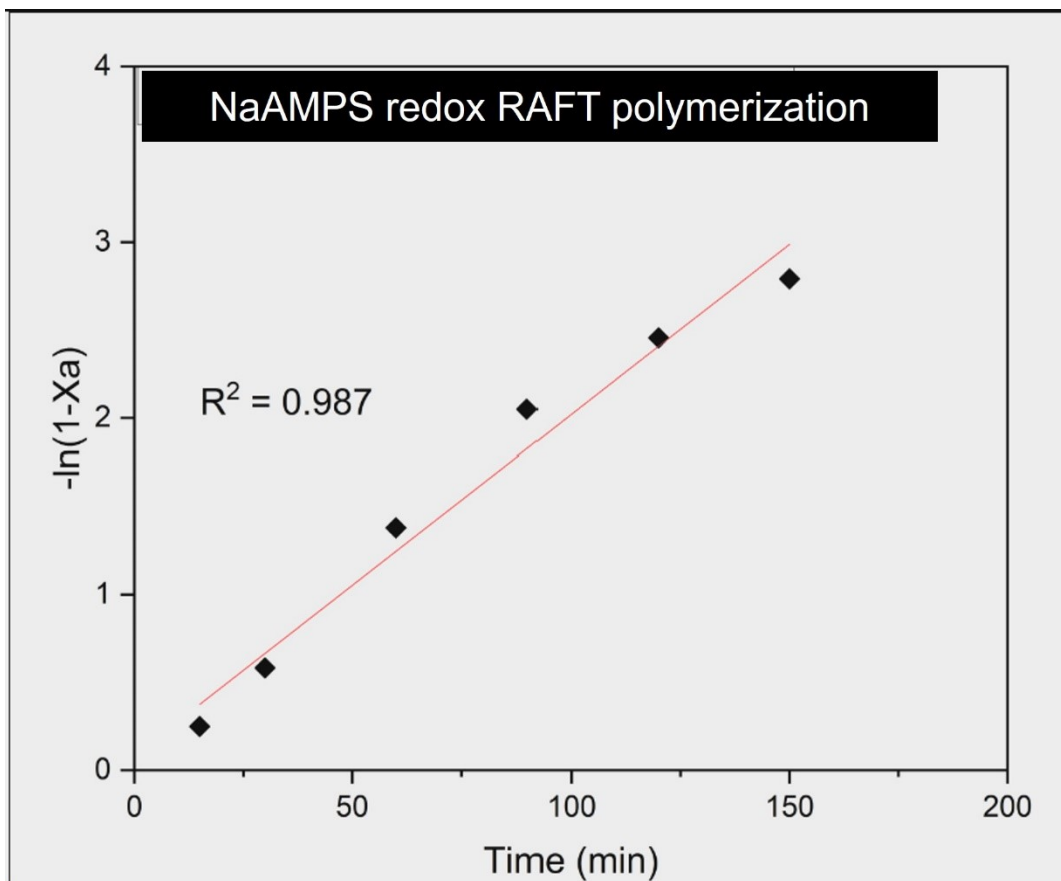


Figure S2 – kinetic plot of the homopolymerization of NaAMPS in redox-RAFT conditions

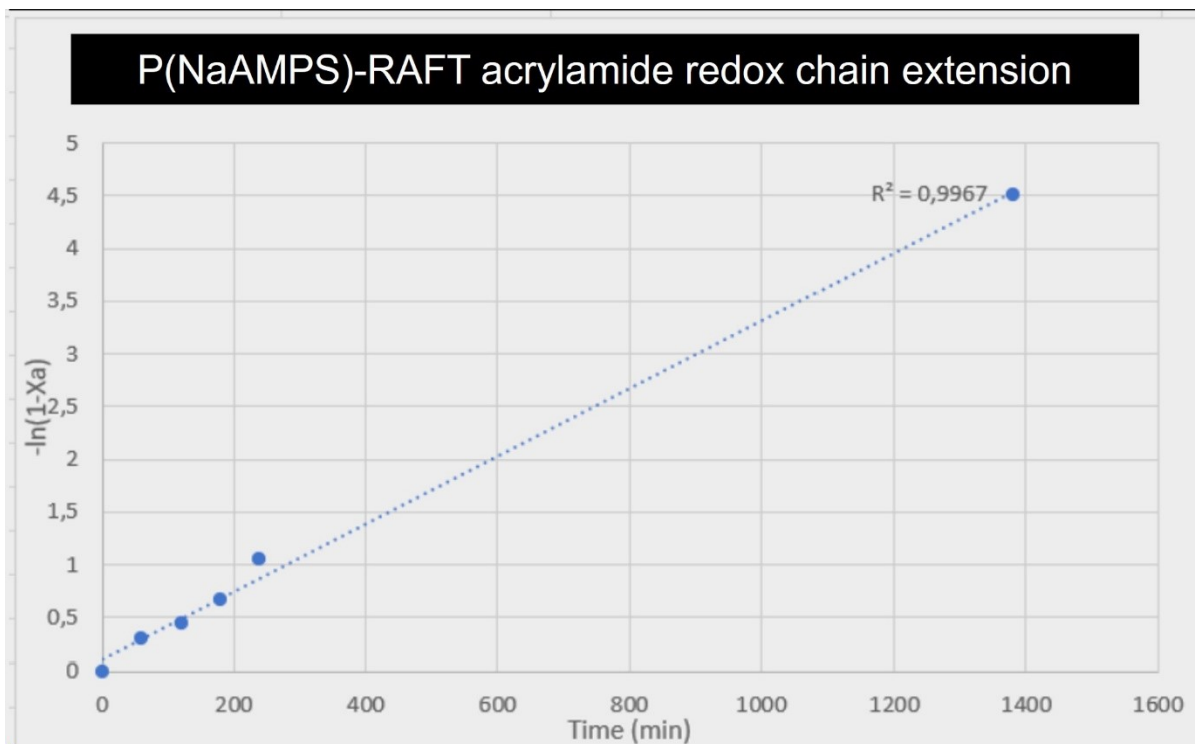


Figure S3 - kinetic plot of the homopolymerization of acrylamide in presence of P(NaAMPS)-RAFT chain transfer agent under redox-RAFT conditions

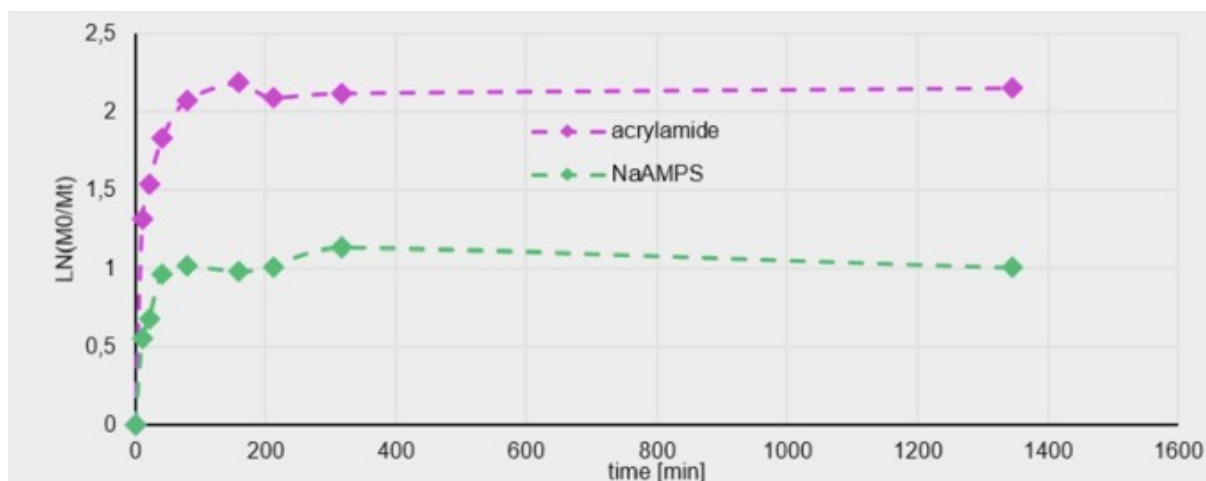


Figure S4 – kinetic plot for the co-polymerization of acrylamide and Na-AMPS in water under redox-RAFT conditions

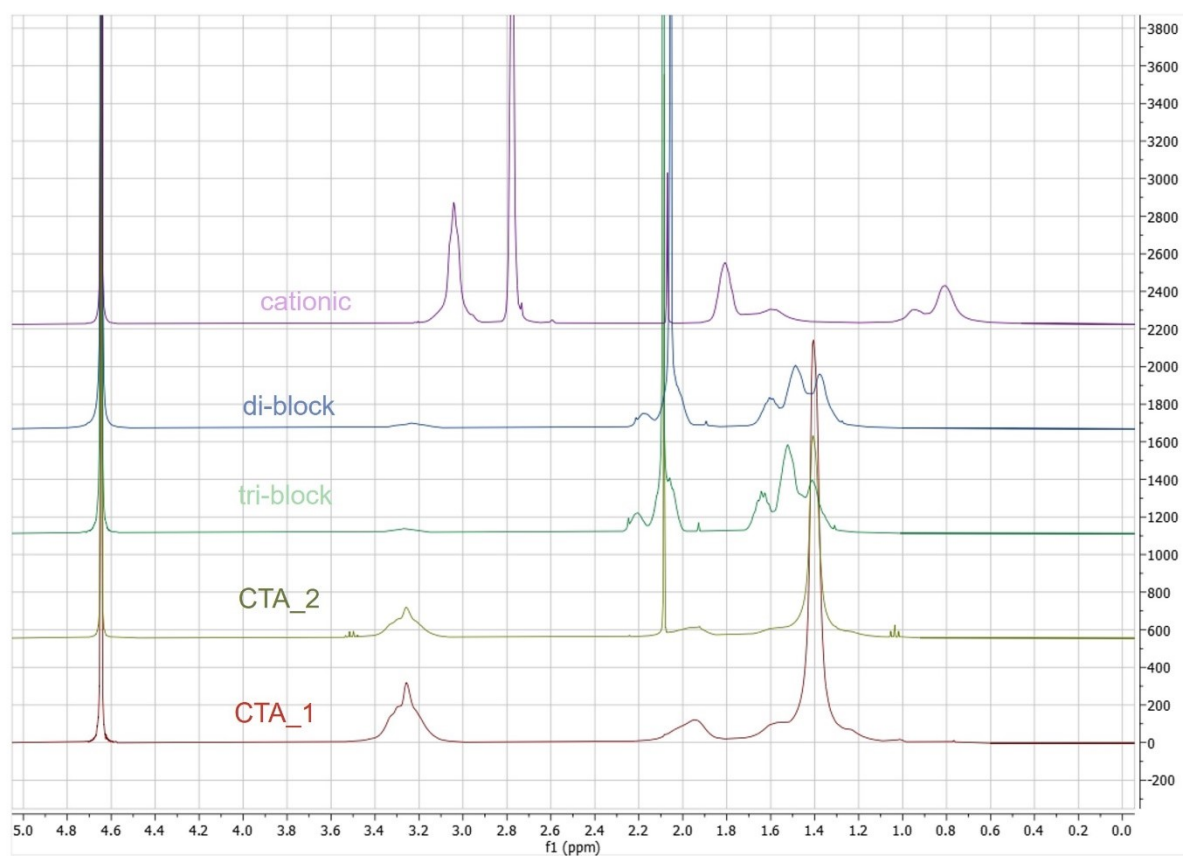


Figure S5 – ¹H NMR spectra of all polymers synthesized in this work (recorded in D₂O)

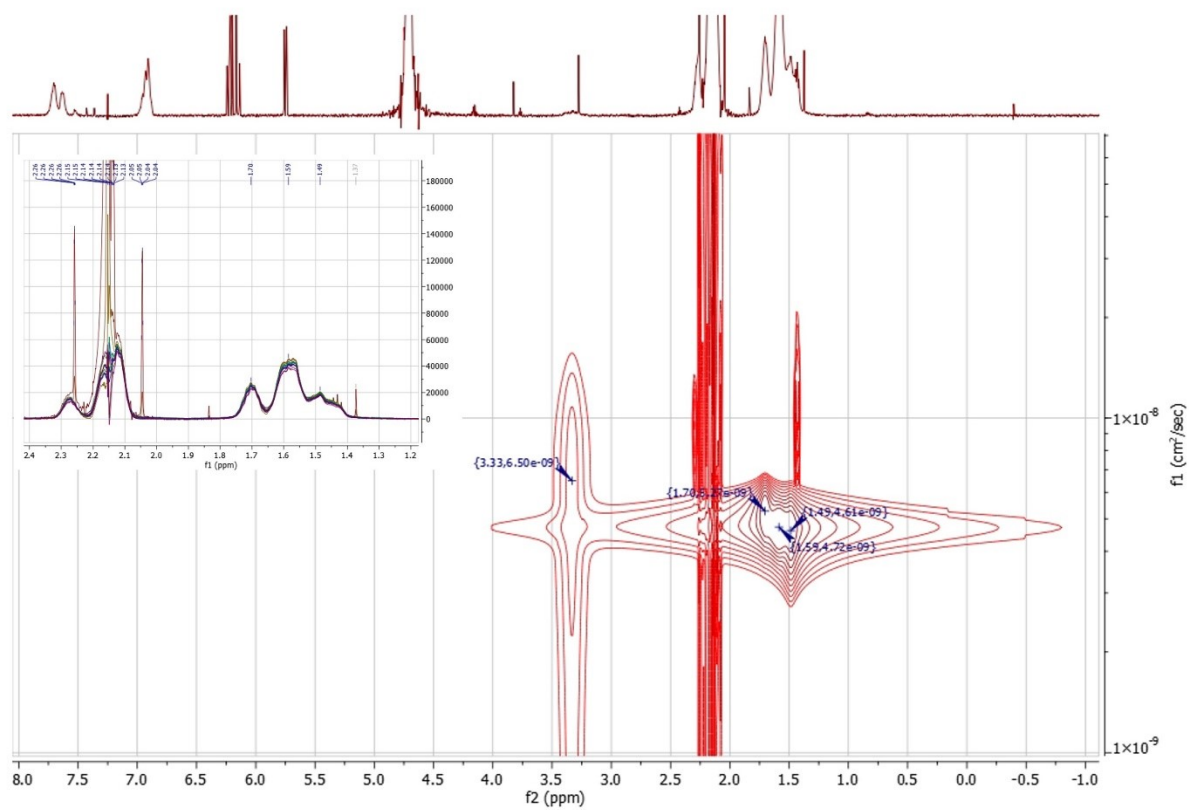


Figure S6 – 1H DOSY 2D spectrum recorded for the di-block copolymer in D₂O

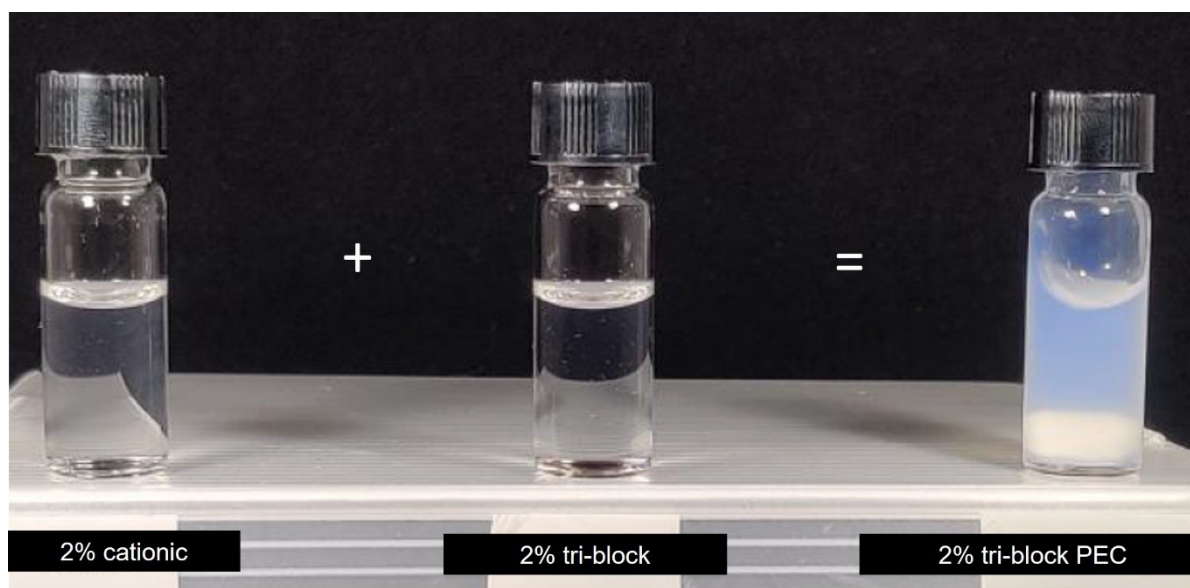


Figure S7 – Change in cloudiness of solutions upon coacervation (tri-block copolymer)

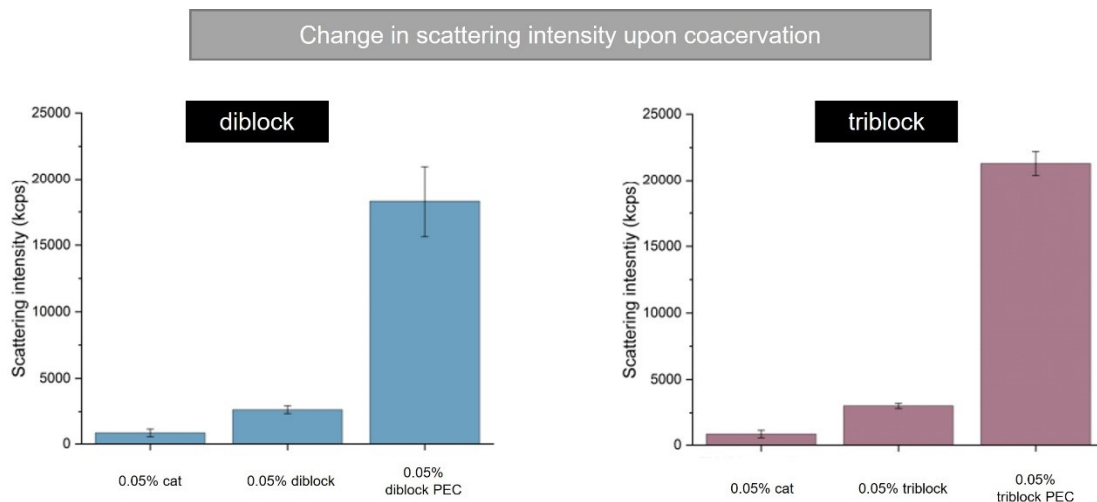


Figure S8 – Increase in scattering intensity upon coacervation of the block copolymer solutions

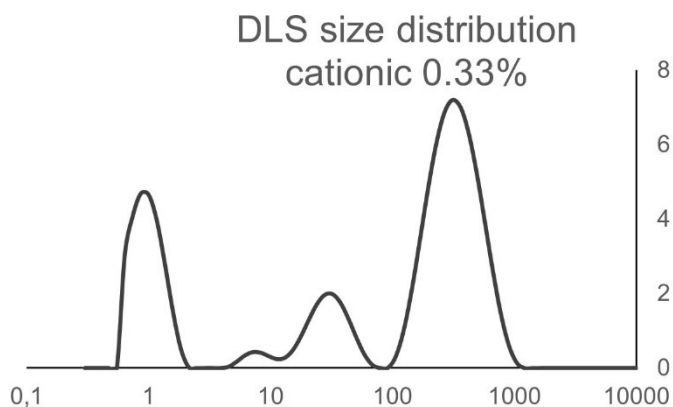


Figure S9 – DLS size distribution of the cationic P(DMAPMA) homopolymer. The reliability of this measurement is reduced by the high concentration of the polymer (required to reach sufficiently high scattering intensities), as well as the lack of sample filtration (regular hydrophilic filters are not suitable for cationic polymers due to very strong polymer adsorption). The multimodal distribution is reproducible on consecutive measurements and could be related to some aggregation of the polymer at the concentration used.

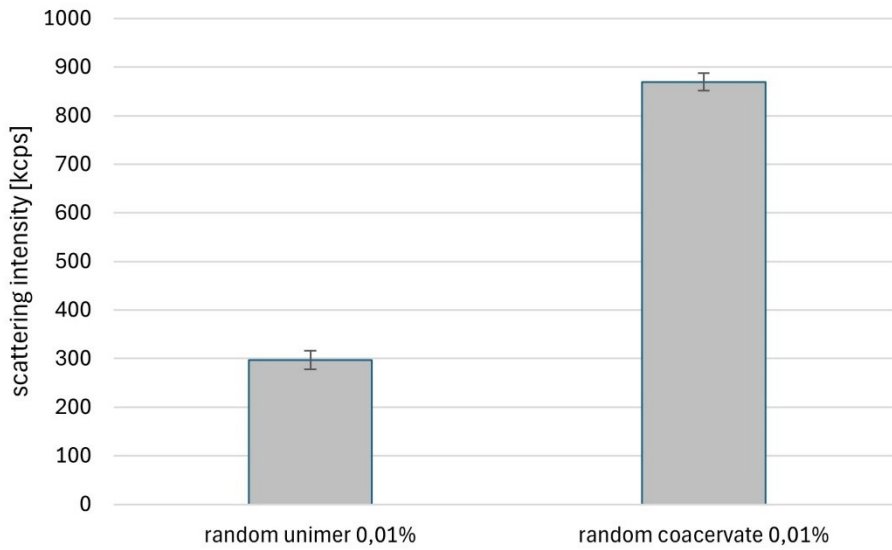


Figure S10 – Increase in scattering intensity upon coacervation of the random copolymer

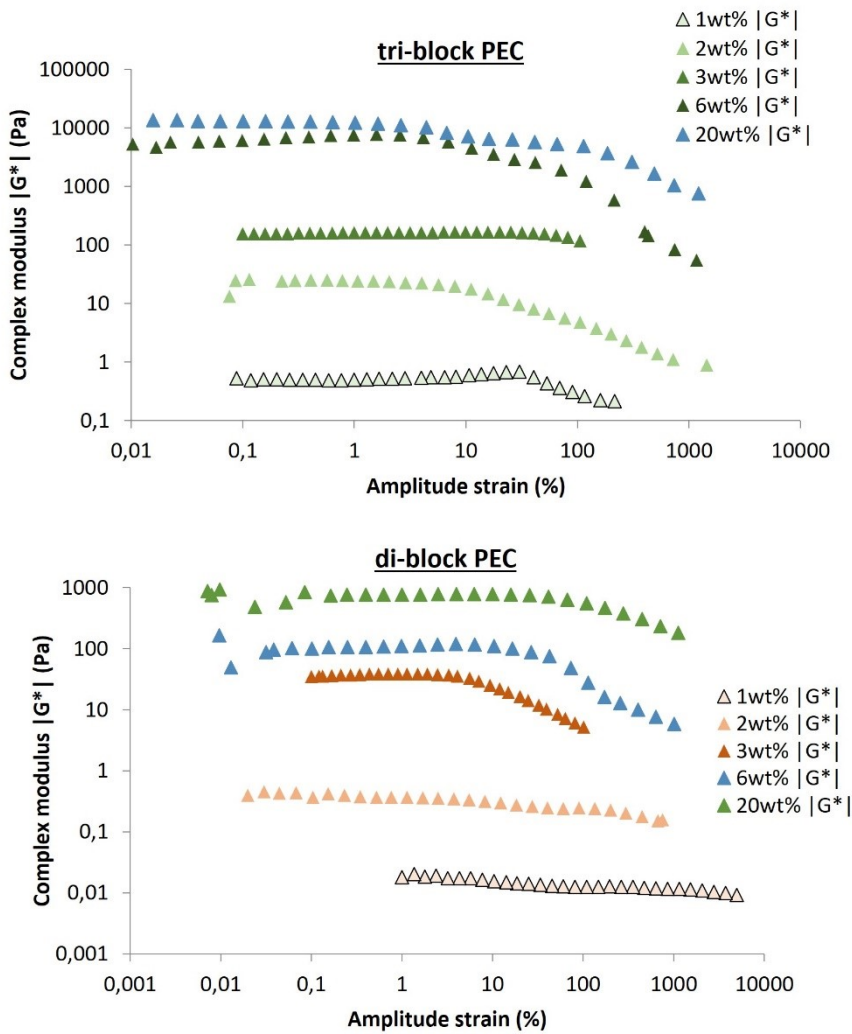


Figure S11 – Amplitude sweeps for the block copolymer coacervate gels showing the LVE

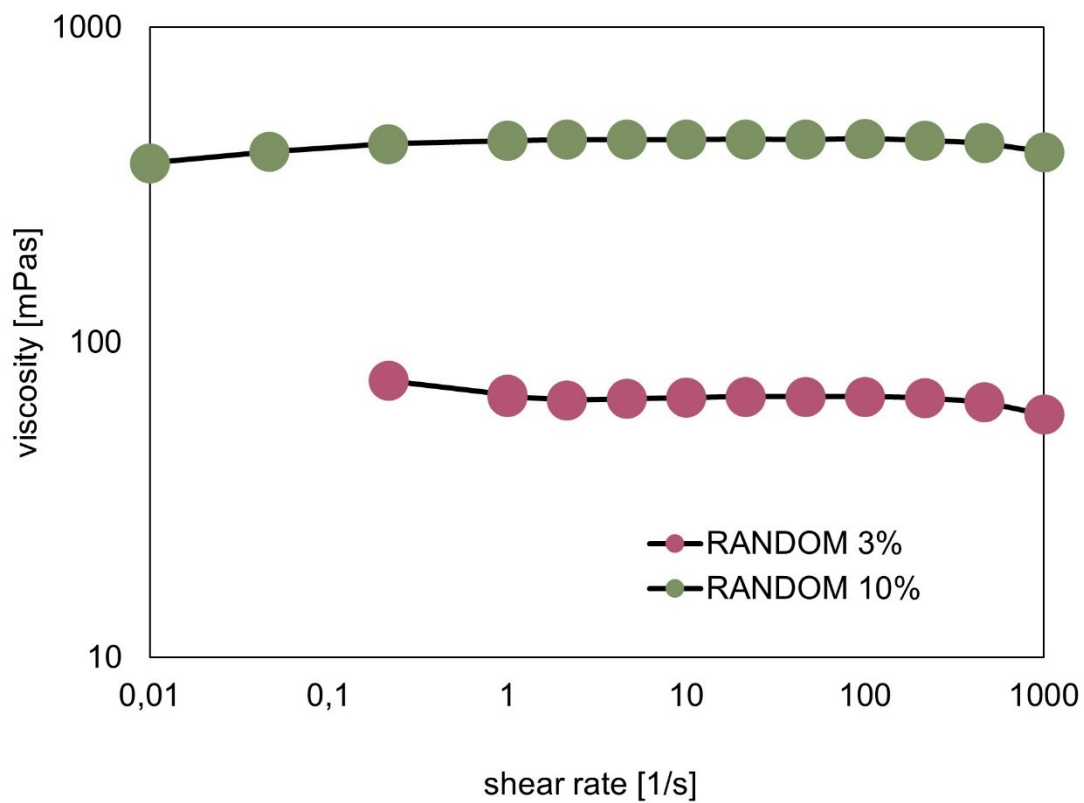


Figure S12 – Shear viscosity for the solutions of the random coacervate

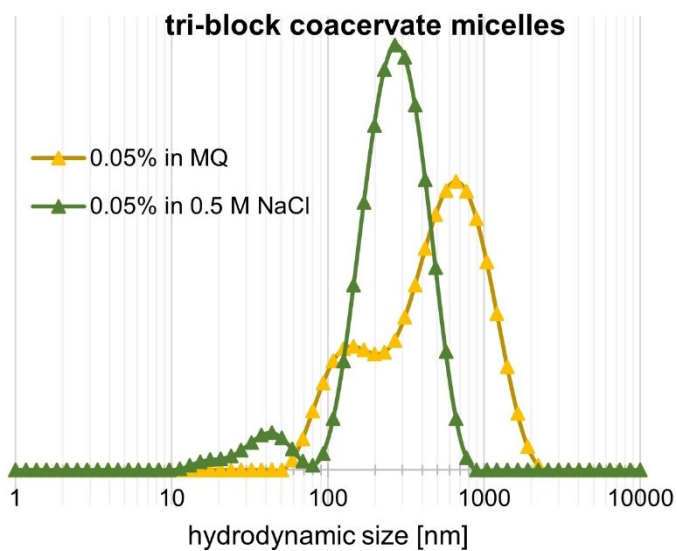


Figure S13 – Change in the DLS size distribution for the triblock coacervate solution upon addition of small amount of NaCl

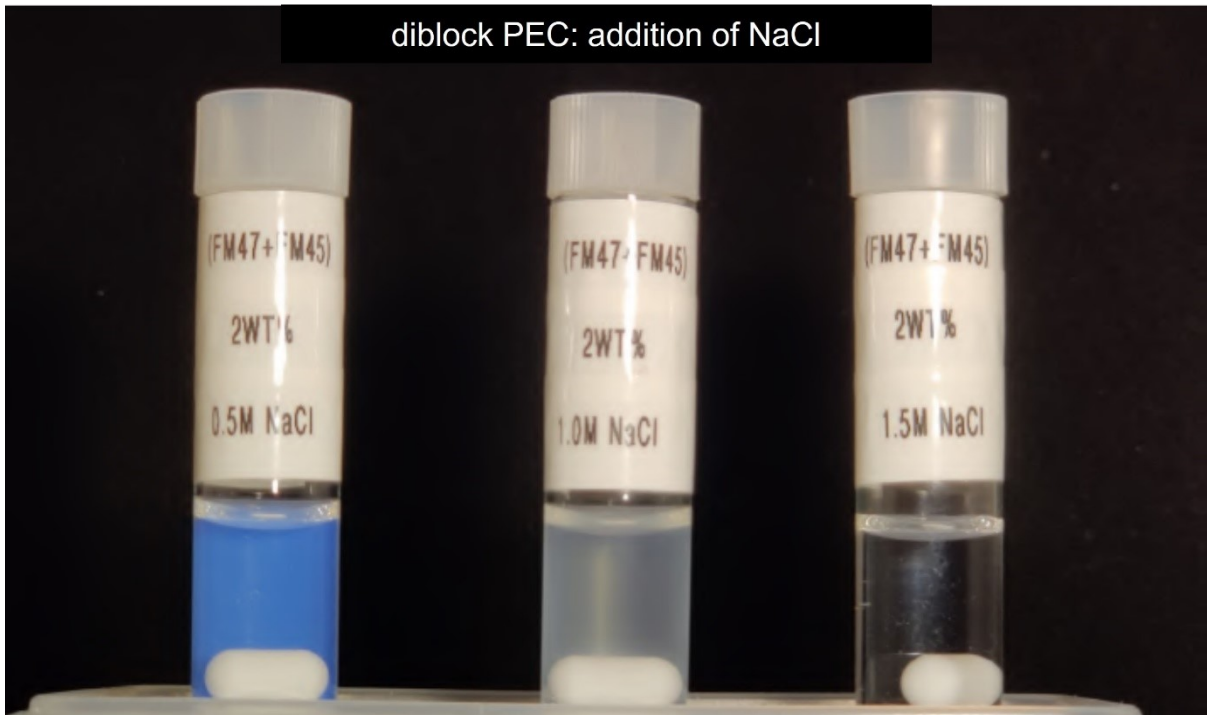


Figure S14 – Change in cloudiness of the diblock coacervate solution upon addition of salt

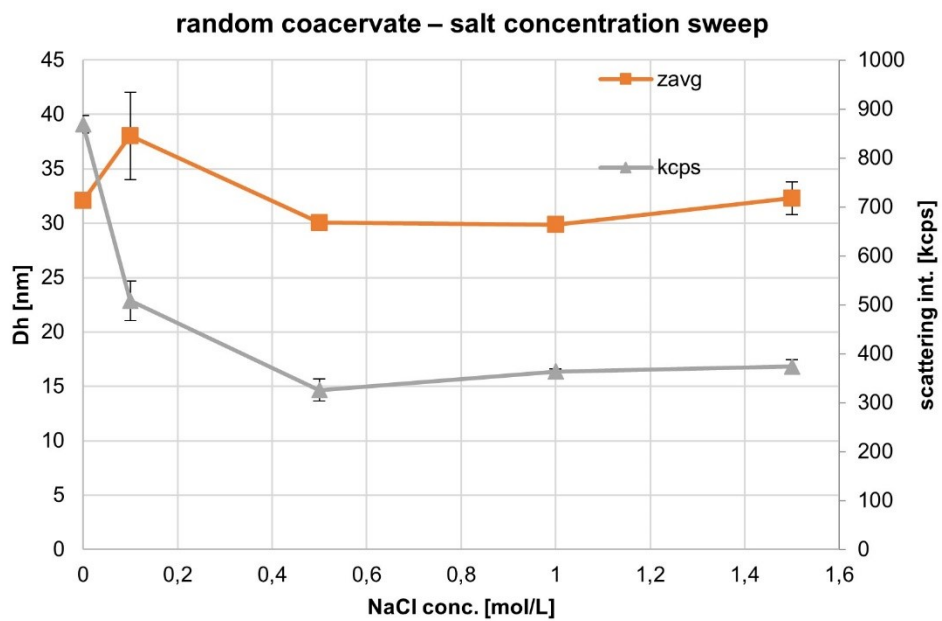


Figure S15 – Effect of salinity on the solution of the random coacervate

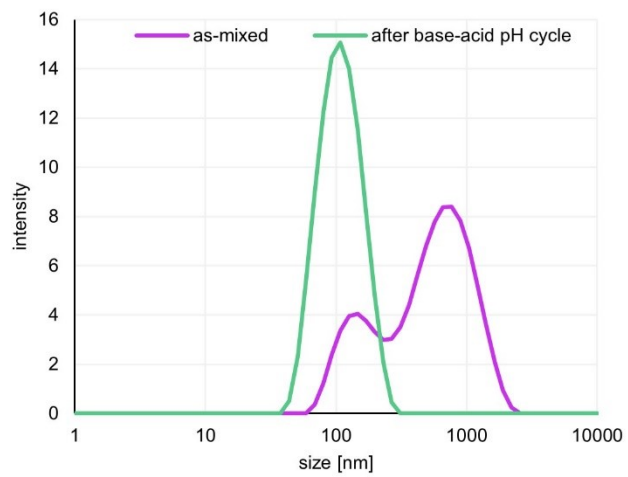


Figure S16 – Effect of pH cycle on the DLS size distribution of the triblock coacervate.