Supporting Information

Interactions Between an Associative Amphiphilic Block Polyelectrolyte and Surfactants in Water: Effect of Charge Type on Solution Properties and Aggregation

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**Surfactants characterization**

Surface tension curves for the studied surfactants are reported in Figure S1. Except for PEGMe, that has low hydrophobicity, they all present a clear CMC. The nonionic surfactants differ by their surface activity (Figure S1, supporting information). Moreover, they can be considered polymeric surfactants, due to their relatively high molecular weight. These are usually interesting from a point of view of rheological properties.[1]

The values for Pluronic [2] and CTAB [3] measured here are in agreement with values reported in literature.

**Figure S1**. Surface tension curves of the studied surfactants

**Surface tension measurements**

Surface tension plots discussed in section 3.1.2 and 3.1.3 are reported here below

**Figure S2**. Surface tension curve of CTAB (left) and Pluronic (right) in absence and presence of 0.5 wt % polymer

**Figure S3**. Surface tension values of 0.1 wt % solution of PEGMe at different polymer concentrations

**Rheological measurements**

Shear viscosity plots discussed in section 3.2 are reported here below

**Figure S4**. Shear viscosity of a 0.1 wt % polymer solution with increasing amount of Enordet

**References**

[1] P. Raffa, D.A.Z. Wever, F. Picchioni, A.A. Broekhuis, Polymeric surfactants: Synthesis, properties, and links to applications, Chem. Rev. 115 (2015). https://doi.org/10.1021/cr500129h.

[2] P. Alexandridis, J.F. Holzwarth, T.A. Hatton, Micellization of Polyethylene oxide)-Poly(propylene oxide)-Poly(ethylene oxide) Triblock Copolymers in Aqueous Solutions: Thermodynamics of Copolymer Association, 1994. https://pubs.acs.org/sharingguidelines (accessed March 25, 2021).

[3] P. Ekwall, L. Mandell, P. Solyom, The aqueous cetyl trimethylammonium bromide solutions, J. Colloid Interface Sci. 35 (1971) 519–528. https://doi.org/10.1016/0021-9797(71)90210-4.