



Contribution ID: 213

Type: **Talk**

Ion selectivity at the origin of block copolyelectrolyte micelle formation

Thursday, 10 December 2020 14:00 (15 minutes)

Novel block copolymers consisting of two anionic polyelectrolyte blocks [NaPA and NaPSS] have been synthesized. In the presence of certain amounts of divalent cations such as Calcium, Strontium and Barium, supramolecular structures are formed. The overall size and molecular weight of these structures have been obtained by combined static and dynamic light scattering (SLS & DLS). Via small-angle neutron scattering (SANS) the existence of core-shell micellar structures could be proven [1, 2]. Additional experiments using a deuterated polyacrylic acid block enabled us to elucidate the micellar composition. Core-shell structures are formed because the two charged polymer blocks possess different complexation affinities with respect to oppositely charged cations.

In a next step, solutions which are still in the single chain region of the phase diagram, but close to the phase boundary, have been prepared. Playing with temperature we succeeded in triggering micelle formation [3]. Decreasing the temperature induced micelle formation with Barium and Strontium, but not with Calcium. Surprisingly, the micellar structures were inverted in composition. Heating these solutions up to ambient temperature led to a dissolution of the micellar aggregates. Heating up even further to 65°C led again to a formation of micelles.

References

- [1] N. Carl et al. *Soft Matter* (2019) 15 8266
- [2] N. Carl et al. *Colloid Polym. Sci* (2020) 298 663
- [3] N. Carl et al. *Macromolecules* (2019) 52 8759...

Primary authors: SCHWEINS, Ralf (Institut Laue - Langevin); PREVOST, Sylvain (Institut Laue Langevin); Dr CARL, Nico (Institut Laue - Langevin); Prof. HUBER, Klaus (Universität Paderborn)

Presenter: SCHWEINS, Ralf (Institut Laue - Langevin)

Session Classification: DN2020. Soft Matter

Track Classification: DN: Soft Matter