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Tunable Soft Nano Colloids: A Model System[1] SUDIPTA GUPTA, LaCNS, LSU, Baton Rouge, LA 70803, USA, JOERG STELLBRINK, DIETER RICHTER, JCNS, Forschungszentrum Jlich, Germany, GARRETT STERNHAGEN, DONGHUI ZHANG, GERALD SCHNEIDER, LaCNS, LSU, Baton Rouge, LA 70803, USA — We introduce two different class of soft colloids, namely charge neutral and charged systems, with tunable morphology and architecture at the individual particle level. They are experimentally realized by diblock-co polymer micelles exhibiting star-like core-shell architecture. For uncharged micelles, we proved that just by changing the ratio of the repetitive units of the individual block copolymer we can tune the number of arms attached to the central core, a.k.a. the aggregation number and their softness. A fascinating hyperuniform state was created where Stokes-Einstein relation was not violated on approaching gel point. The second class of charged soft colloids forms a model system for polyelectrolyte micelles based on newly synthesized polypeptoid amphiphiles. In this case we are able to tune the aggregation number, simply by placing a charged monomer at different position along the corona segment. Such a high degree of accuracy is made possible by precise precision synthesis of the amphiphilic peptoids. Both these class of micelles are characterized by state of the art neutron scattering techniques. The dynamics of the uncharged micelles was investigated in combination of DLS, rheology and BD simulation. *S. Gupta et al., Nanoscale 7, 13924 (2015); PRL 115, 128302 (2015).

[1]LaCNS; IHRS Bio-Soft

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