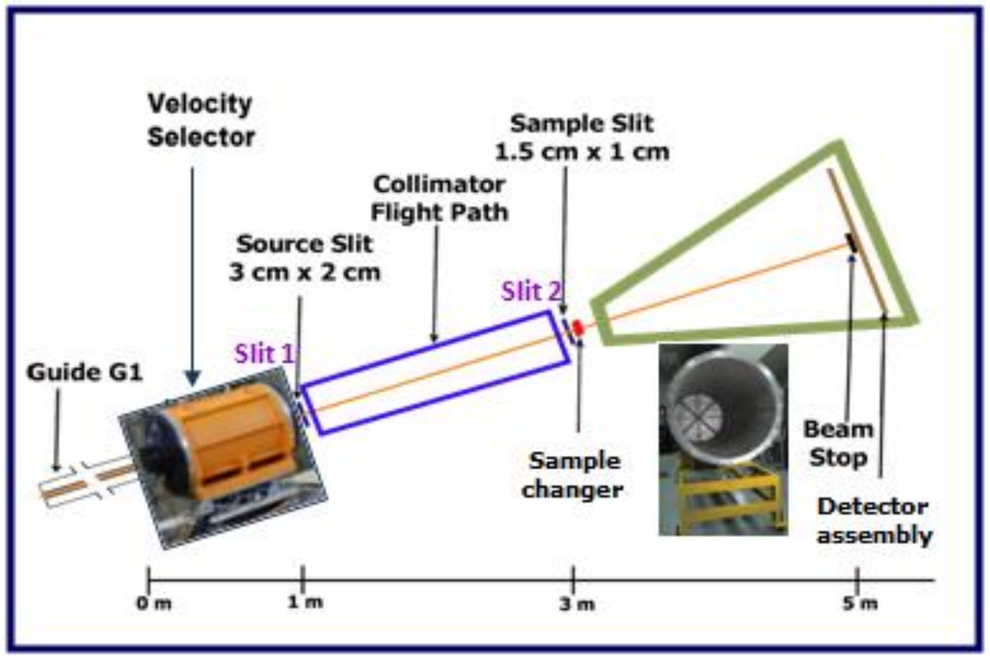
Small-Angle Neutron Scattering Diffractometer (SANS-I)

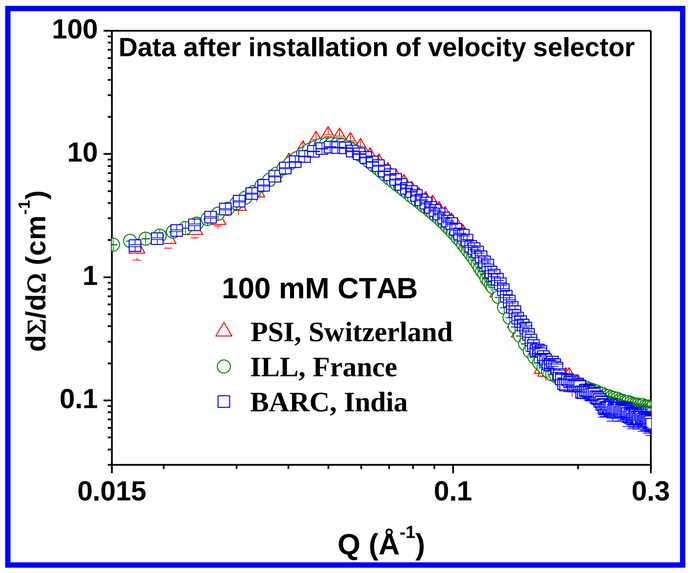
Instrument



Instrument parameters

Monochromator	Velocity Selector
$\lambda_{average}$	4 – 10 Å
$\Delta\lambda/\lambda$	10 - 20 %
Source slit (S1)	3 cm × 2 cm
Sample slit (S2)	1.5 cm × 1 cm
Distance S1 & S2	2 m
Distance S2 & D	1.85 m
Detector (D)	Linear He^3-PSDs in crossed-geometry
Flux	2×10^5 n/cm^2/sec
Q range	0.01– 0.4 Å^{-1}

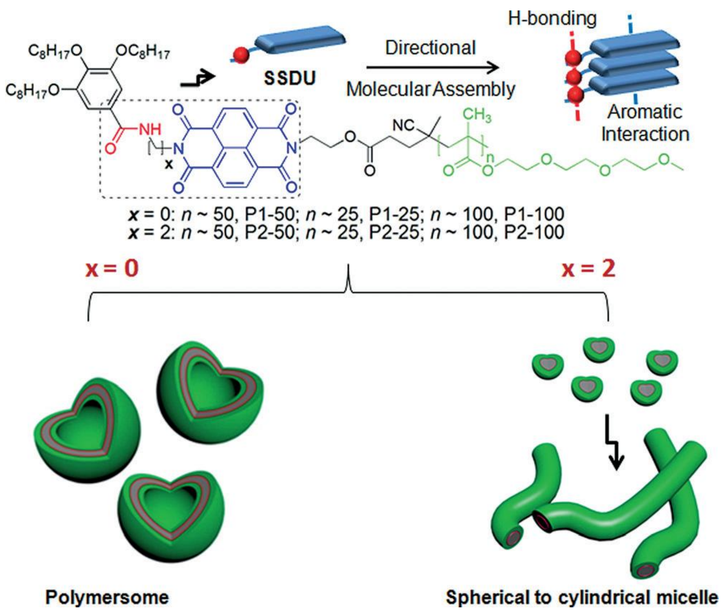
V.K. Aswal and P.S. Goyal, Current Science 79, 947 (2000)



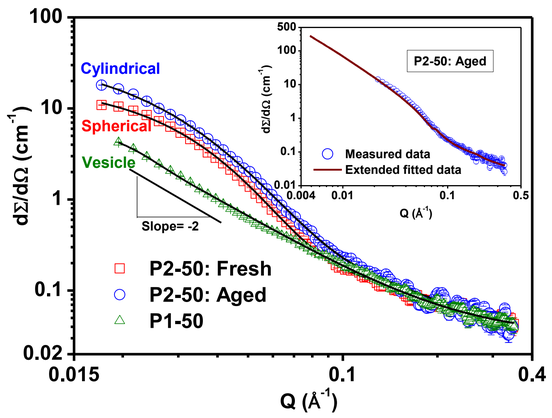
SANS-I: Some Results

Self-assembly of Amphiphilic Block Copolymer

Directional molecular interaction has been shown to overturn the classical norms of block-copolymer self-assembly driven by packing parameters.



Two block copolymers with identical chemical structures and the same hydrophobic/hydrophilic balance organized in a distinct manner form either cylindrical micelles or polymersomes depending on whether the SSDU contains an amide or a hydrazide functional group, respectively.

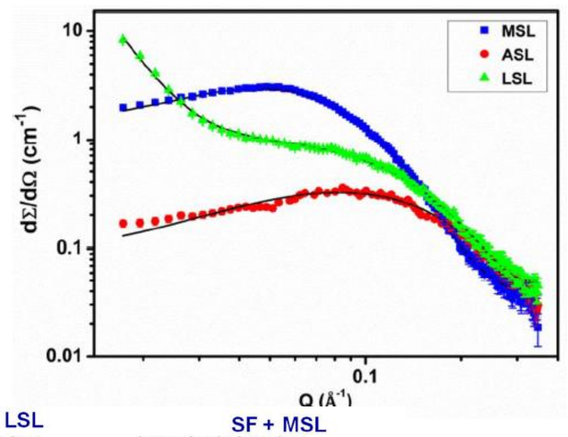


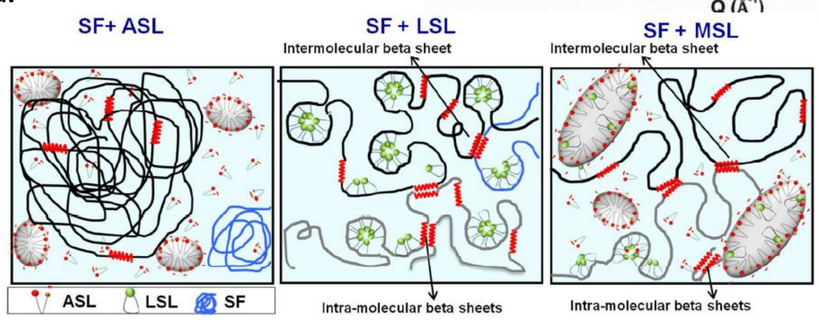
Angewandte Chemie 129, 3570 (2017)

Mechanism of Silk Fibroin-Sophorolipid Gelation

Silk Fibroin is a promising material for biomedical applications and sophorolipid is a biofunctional molecule. It is found that sophorolipids accelerate the gelation of silk fibroin to produce functional hydrogels.

The mechanism for accelerated gelation of silk fibroin as well as role of the structure and assembling property upon using sophorolipid have been formulated.

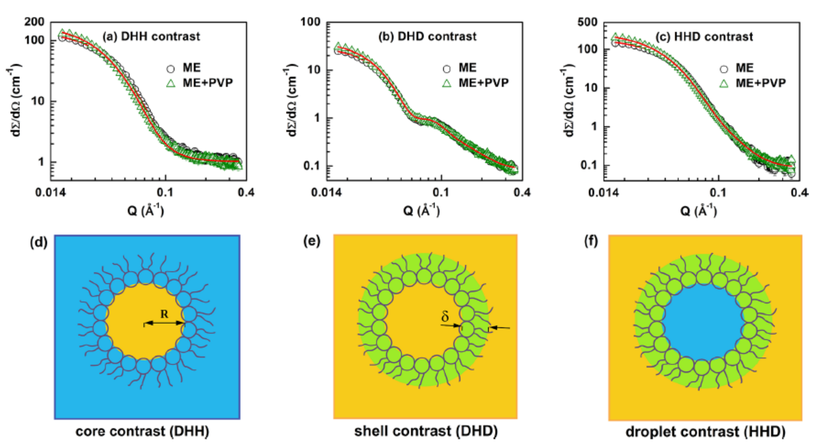




Biomacromolecules 17, 3318 (2016)

Polymer Loaded Reverse Microemulsions

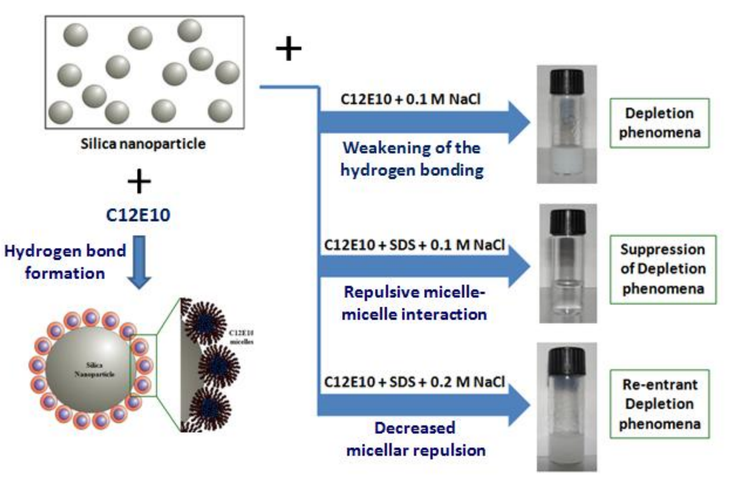
The influence of hydrophilic polymers on the percolation transition temperature, the phase stability, and the stiffness (elastic bending rigidity) of reverse microemulsion droplets has been investigated.



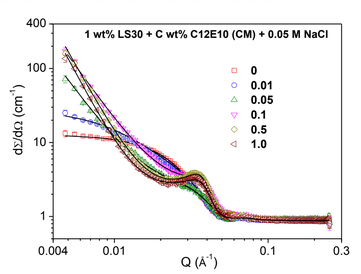
Upon incorporation of PVP polymer chains into the microemulsion droplet, the elastic bending rigidity of the surfactant monolayer increases up to ~46%, whereas for PEG-loaded microemulsions the corresponding increase is ~17%.

Langmuir 33, 13014 (2017)

Micelle-induced Depletion Interaction in Nanoparticles



Adsorption vs. depletion in anionic silica nanoparticle-non-ionic surfactant C12E10 system can be tuned by the presence of electrolyte as well as anionic surfactant SDS.



Journal of Applied Physics 117, 164310 (2015)