ESRF	**Experiment title:** Transitions between self-assembled structures of SDS/2ß-CD complexes	**Experiment number**: 26-02 795
Beamline: BM-26B	**Date of experiment**: from:07/11/2016 to: 10/11/2016	**Date of report**: 24/11/2016
Shifts: 6	**Local contact(s)**: Dr. Daniel Hermida	*Received at ESRF:*

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Report:

The objective of this experiment was the determination of the interlayer separation of multiwalled self-assembled microtubes of SDS/2ß-CD complexes that spontaneously form in water when cooled down from elevated temperatures. The concentration and ionic strength have a strong influence on the structures that are formed, and our aim was to obtain quantitative information about the distances in the system in those different circumstances.

Samples were measured in glass capillaries that were filled with the already cooled down suspensions and centrifuged shortly to force the viscous suspensions into the capillaries. The use of centrifugation caused a partial alignment that is particularly visible in the SAXS patterns of highly concentrated samples. The samples were subjected to a temperature programme, inducing the complete melting of the self-assembled structures and the consequent slow cooling down, in which the structures reformed, this time without preferential alignment.

Fig. 1 shows azimuthally integrated SAXS patterns of samples without added salt, showing the effect of an increased concentration. These measurements were taken after the heating cycle, and therefore represent an isotropic configuration. At higher concentrations the peaks show a shift to higher q, corresponding with lower spacings. At the same time, the intra-layer separation, visible in the three peaks at the highest q, do not shift visibly. The structure inside the layers remains the same, then.

Fig. 2 shows SAXS patterns of samples at the same concentration at different ionic strengths. Here we see that the highest concentration of salt has a very slightly shifted peak corresponding to the inter-layer separation. The effect is very small.

We measured WAXS patterns simultaneously, which will aid in the characterisation of the intra-layer separation.

We would like to thank Daniel Hermida for his support during this experiment.

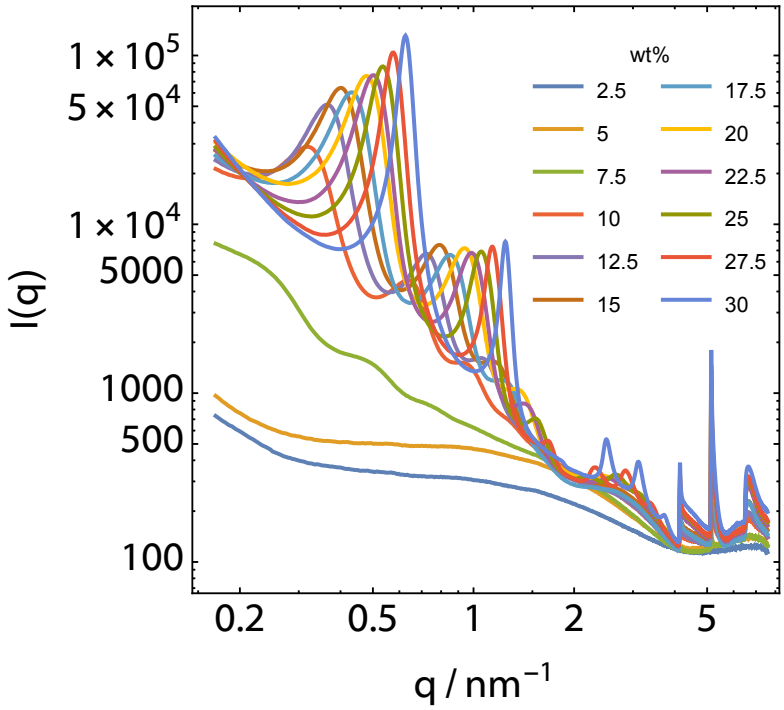

Figure 1: Azimuthally integrated SAXS patterns of samples with no added salt, at different concentration of SDS/2ß-CD concentration. At the lowest concentrations no structure peaks are visible. From higher concentrations the peaks shift to higher q, corresponding to lower spacings. The peaks in the high q range, corresponding to intra-layer structure, do not shift as a function of concentration.

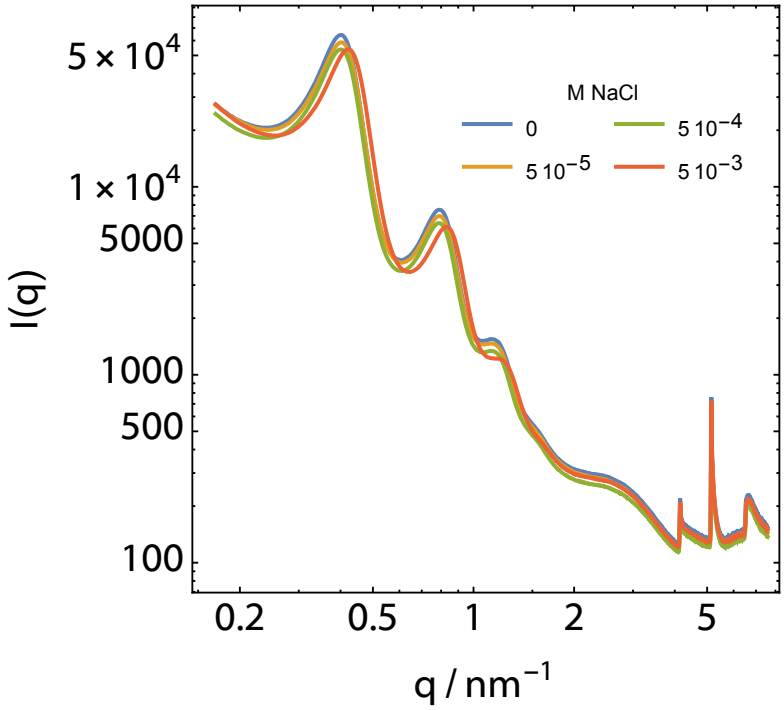

Figure 2: Azimuthally integrated SAXS patterns of samples at a concentration of 15wt%, for different ionic strengths. A very similar structure is observed for all salt concentrations, yet a miniscule shift to higher q is observed for the higher concentrations.