Experimental Report

ID02 2007 april 5 to april 9

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We investigated the dynamics of formation of the mesoporous silica SBA-15 using both USAXS and SAXS[1].

SBA-15 can under certain synthesis conditions form particles with different morphologies/sizes. A simple way to achieve this morphology control is by simply changing the synthesis temperature. At the lower temperatures unusual platelike morphologies are observed and at higher temperatures particles with approximately the same diameter as height are observed.

We investigated the formation of the two morphology types at four different synthesis temperatures (50, 55, 60, 65°C), where the two lower temperatures give rise to the platelike morphologies. The formation and evolution of the structure was followed by SAXS and the larger scale information was obtained with USAXS. The USAXS and SAXS data was combined (figure 1). From the resulting information, combined with a UV-Vis investigation, we could establish a timeline for the formation events on different length scales.

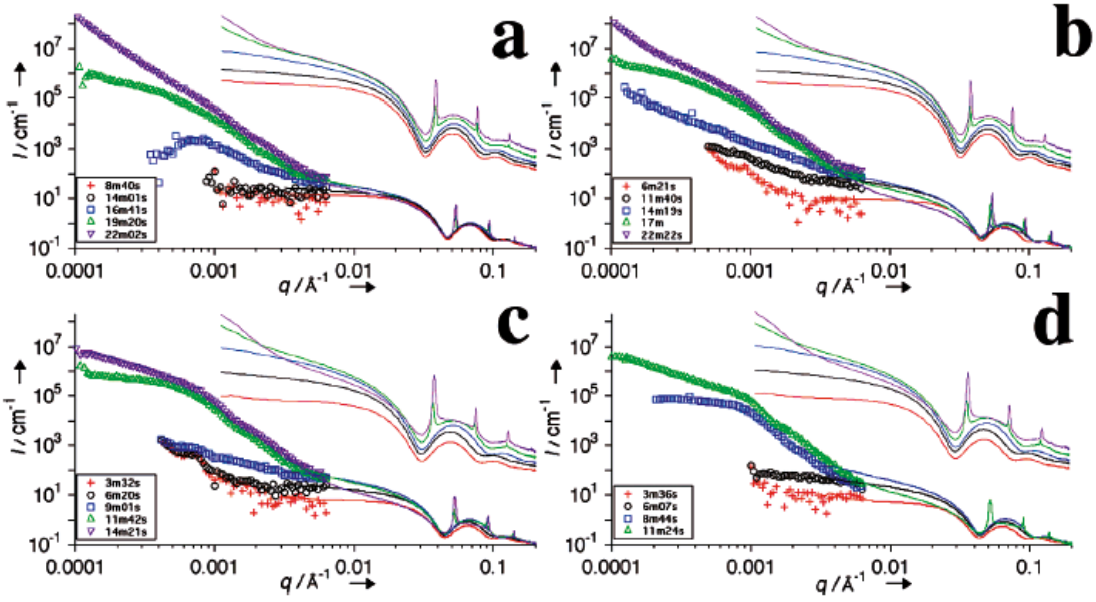

Figure 1. Combined USAXS and SAXS data of the formation of SBA-15 at four temperatures (50 (a), 55 (b), 60 (c) and 65°C (d))[1].

1. Linton, P., Rennie, A. R., Zackrisson, M. & Alfredsson, V. In Situ Observation of the Genesis of Mesoporous Silica SBA-15: Dynamics on Length Scales from 1 nm to 1 mu m. *Langmuir* **25**, 4685-4691, doi:Doi 10.1021/La803543z (2009).