Experimental report

13/05/2019

Proposal: TEST-2969 **Council:** 4/2018

Title: Dynamics in super-concentrated acetonitrile/LiTFSI electrolytes

Research area:

This proposal is a new proposal

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Experimental team: Henriette Wase HANSEN

Local contacts: Michael Marek KOZA

Samples: Deuterated acetonitrile w. different concentrations of LiTFSI salt
C2D3N-CF3SO2NLiSO2CF3

Instrument	Requested days	Allocated days	From	To
IN5	2	2	26/09/2018	28/09/2018

Abstract:

Beamtime report from IN5, experiment TEST-2969 26-28 September 2018

Henriette Wase Hansen

Local contact: Michael Marek Koza
Power: 51 MW
Wavelength: 5 Å, 12 000 rpm.

Sample: Fully deuterated acetonitrile d3-AN, and with salts: d3-AN20:1LiTFSI, d3-AN5:1LiTFSI, and d3-AN2:1LiTFS.

Normal cylindrical aluminium cells of 0.25 to 0.3 mm thickness for the deuterated samples.

This experiment compliments the IN16B data measured on the same sample and in same cells, etc., as carried out 17-21 September 2018, exp. 6-02-589.

Dynamic structure factor

Counting time per spectrum: 1 h

Spectra were measured at the same state points as on IN16B, at 2, 225, 235, 250, 275 and 300 K for all four samlpes with deuterated acetonitrile. And in addition, at 320 K (maximum temperature of the cryostat) for D3-AN20 and D3-AN5, and D3-AN2. A comparison of the four different samples at 275 and 300 K are shown in Fig. 1, respectively, for $Q = 0.6,\ 1.3$ and $1.8\,\text{Å}^{-1}$.

As on IN16B, we observe no signs in the Q-dependence of a prepeak in the samples with salt, which is observed in the structure data from x-ray. There is also nothing to see in the integrated $S(Q)$ from IN5; all four samples behave like liquids with no mesoscopic length scale.

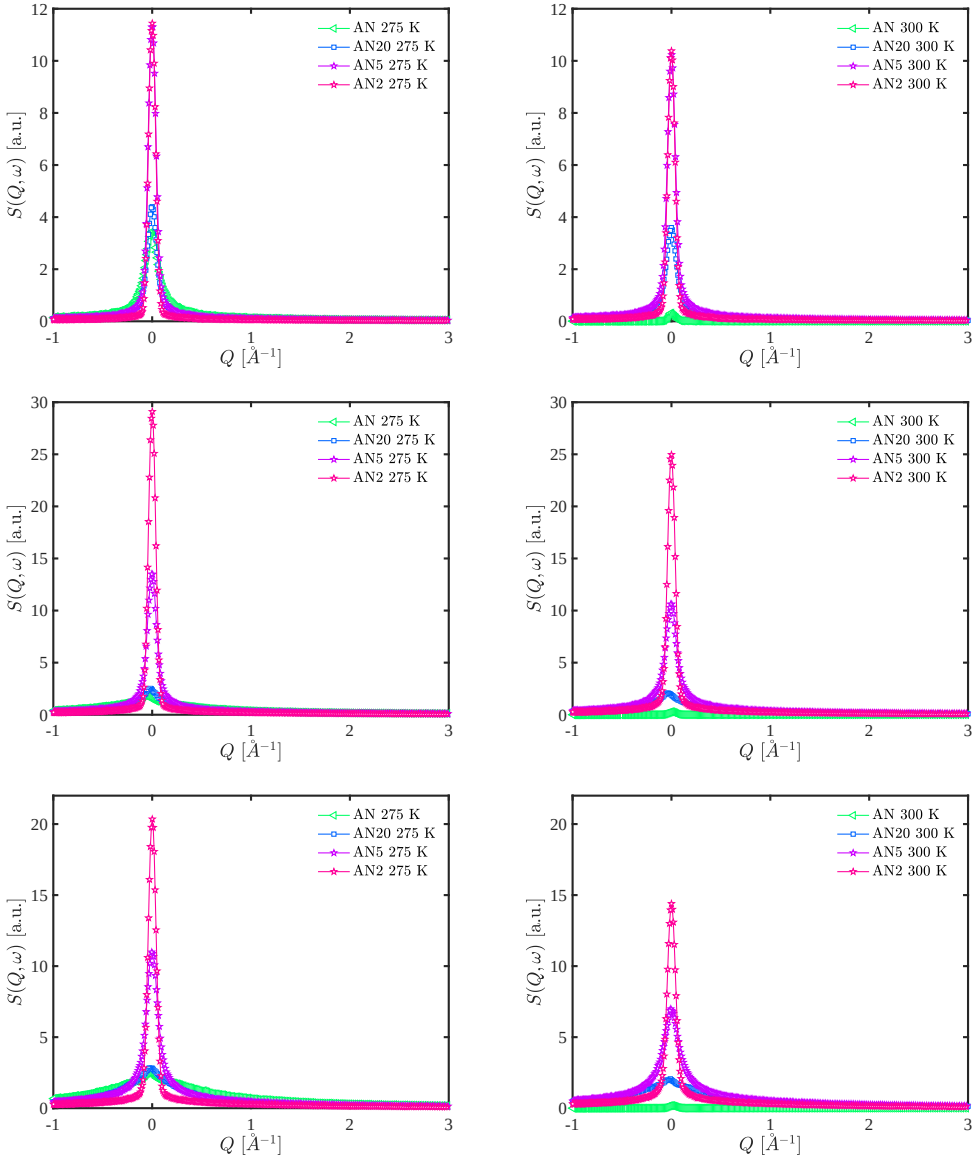

Figure 1: $S(Q,\omega)$ of the four samples at 275 K (left) and 300 K (right). Here shown for 0.6 Å^{-1} (top), 1.3 Å^{-1} (middle) and 1.8 Å^{-1} (bottom).