

# Experimental report

06/09/2018

**Proposal:** INTER-415

**Council:** 4/2018

**Title:** Dynamics in low molecular glassformers near the glass transition

**Research area:**

**This proposal is a new proposal**

**Main proposer:** Henriette Wase HANSEN

**Experimental team:** Henriette Wase HANSEN

**Local contacts:** Bernhard FRICK

Henriette Wase HANSEN

**Samples:** d12-cumene (C9D12)

d3-Pyrr14TFSI

d6-Pyrr14TFSI

DC704

Instrument	Requested days	Allocated days	From	To
IN16B	2	2	09/06/2018	11/06/2018

**Abstract:**

# Beamtime report from IN16B, INTER-415, June 2018

Henriette Wase Hansen

Local contact: HWH

Power: 50 MW

Wavelength: 6.27 Å, Si(111)

Sample: fully deuterated d12-cumene and DC704

Normal cylindrical aluminium cell

## Temperature scans on d12-cumene

In Fig. 1, the elastic and inelastic ( $E_{\text{offset}} = 2 \mu\text{eV}$ ) fixed energy window intensity on a temperature scan are plotted for d12-cumene: on cooling entering the supercooled state and the glassy state. Crystallisation is observed on heating, perhaps two crystallisation processes?

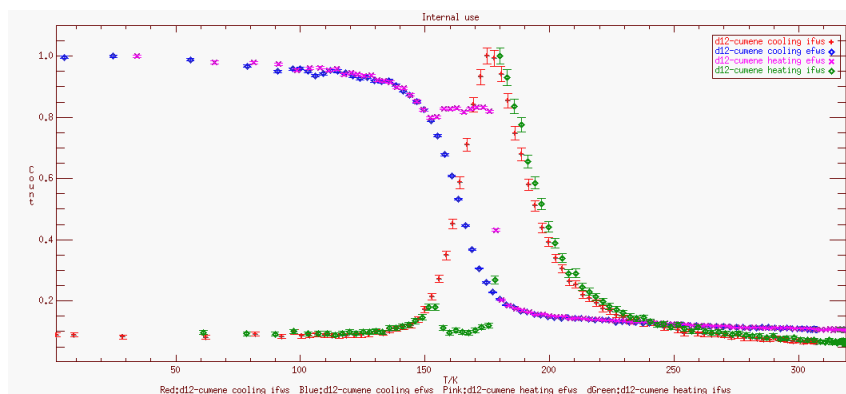
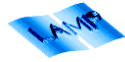
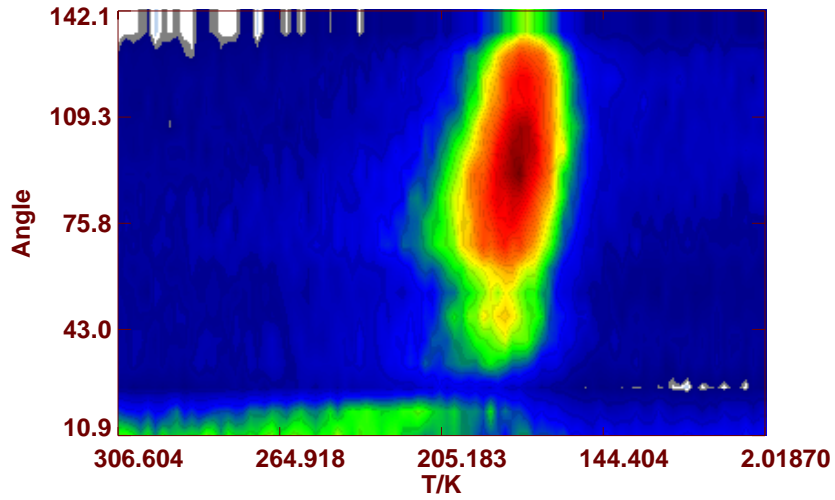


Figure 1: Elastic and inelastic fixed window scans with  $\Delta E = 0$  and  $2 \mu\text{eV}$ , respectively for fully deuterated d12-cumene. Here shown summed over  $Q$ . Crystallisation is observed on heating.



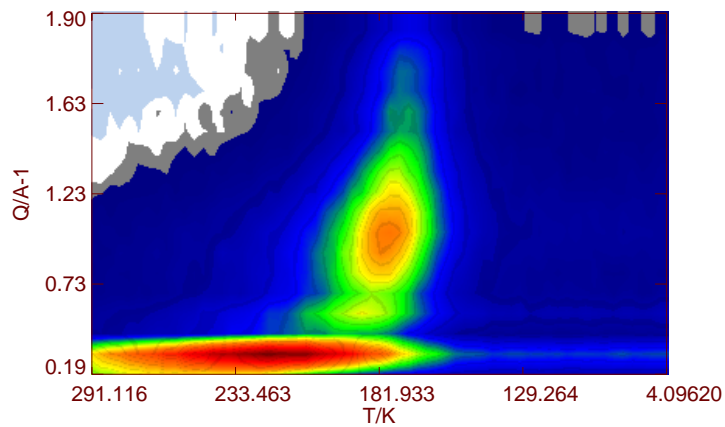
Internal use



IN16B Date 09-Jun-18 03:50:17 User internal use Run 229358 Vert\_int IFWS 229182::229358 bsnorm



The connection between fast and slow dynamics in gla:



IN16B Date 03-Aug-15 09:01:40 User frick Run 117195 Vert\_int IFWS 116951::117197

Figure 2:  $Q$ -dependence of inelastic fixed window scan shown for d12-cumene (top) in comparison to the fully protonated (bottom).

## Temperature scans on DC704

In Fig. 3, the elastic and inelastic ( $E_{\text{offset}} = 2 \mu\text{eV}$ ) fixed energy window intensity on a temperature scan are plotted for DC704. A clear signal from intra-molecular motion is observed below the glass transition ( $T_g = 210 \text{ K}$ ) in the inelastic signal.

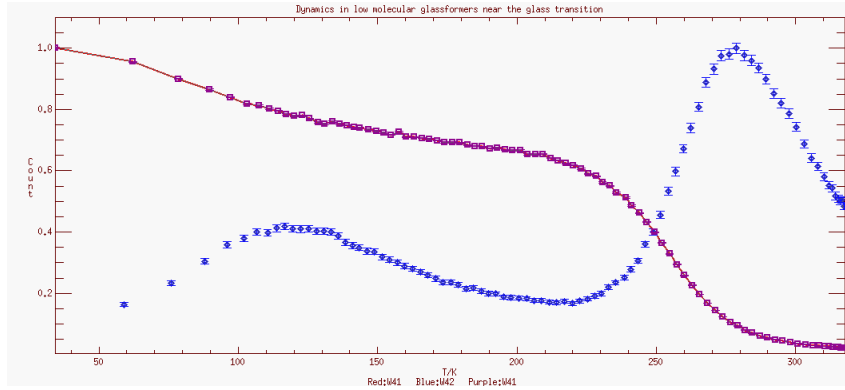


Figure 3: Elastic and inelastic fixed window scans with  $\Delta E = 0$  and  $2 \mu\text{eV}$ , respectively for DC704. Data are here summed over  $Q$ .