

Experimental report

01/12/2021

Proposal: EASY-1052

Council: 4/2021

Title: Can graphite be driven to delaminate osmotically into single platelets?

Research area: Chemistry

This proposal is a new proposal

Main proposer: Sabine ROSENFELDT

Experimental team:

Local contacts: Ralf SCHWEINS

Samples: K(15c5)2C12 in DMSO

Instrument	Requested days	Allocated days	From	To
D22	3	3	09/10/2021	10/10/2021

Abstract:

2D matter provides interesting electrical or optical material properties due to inherent structural anisotropy. To achieve best directional dependent performance often monolayers are required. We believe that we are the first succeeding in a force free delamination of graphite to graphene (osmotic swelling) and want to prove it by SANS. Via an intercalation reaction of graphite with a potassium crown ether complex, the interlayer spacing of graphite is expanded from 3.35 Å to 12 Å. Afterwards, due to the solvation of the interlayer cation in dimethylsulfoxide (DMSO) osmotic swelling is performed. Those delaminated gels we aim to investigate by contrast variation series (in solvent mixtures of H/D-DMSO 0:100, 50:50 and 100:0 v/v). To obtain our aim we need precise absolute intensities with good statistics and low background and a wide q-range. Thus, we it would be very kind if you could measure at least 2 of the samples (fully deuterated, fully protonated) and the corresponding solvents (needed as references during evaluation) at the D22. More information about samples and scientific question will be provided to the local contact.

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EASY-1052

Main Proposer

Name and first name	Address	Phone	Email
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Local contact(s): SCHWEINS Ralf

Main research area: Chemistry

Instruments

Requested instrument	Allocated time (in hours)
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D22

Energy/Wavelength range:

Resolution in energy or wavelength:

Sample description

Substance/Formula: **K(15c5)2C12 in DMSO**Mass: **ca. 600**Size: **ca. 500**State: **gel**

Surface area:

Space group: **none**

Unit cell dimension

T (k) =	a =	b =	c =
	α =	β =	γ =

Sample container: **No container**Sample availability: **06/10/2021**

Safety aspects

The sample is: * **TOXIC** * **PYROPHORIC** * **CORROSIVE**

To be filled in by ILL

Sample environment code	Comments by Health Physics Officer and Safety Engineer
NO	

Abstract

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