Experimental report

12/10/2015

Proposal: TEST-2413 **Council:** 4/2014

Title: ZIF-8 + Methane

Research area:

This proposal is a new proposal

Main proposer: Herve JOBIC

Experimental team: Herve JOBIC

Local contacts: Jacques OLLIVIER

Samples:

Instrument	Requested days	Allocated days	From	To
IN5	3	3	07/11/2014	10/11/2014

Abstract:

Diffusion of CH_4 in ZIF-8 Studied by Quasi-Elastic Neutron Scattering

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Abstract

Quasi-elastic neutron scattering (QENS) measurements have been performed to characterize at the molecular level the diffusion of CH_4 adsorbed at various concentrations in ZIF-8. This allows to compare for the first time diffusivities obtained in a MOF by microscopic and mesoscopic techniques. The good agreement which is observed between the different methods shows that there are no defects obstructing diffusion, which is often the case in zeolites. Even if the effective size of ZIF-8 windows is larger than the diameter derived from crystallography, the characteristic time for intercage diffusion (~ ns) is much longer than the time between jumps within a cage (~ 10 ps) indicating that the organic linkers severely hinder molecule passage.