



New Application Articles

"Physical aging of glassy PMMA/toluene films: Influence of drying/swelling history"

Researchers from Université Pierre et Marie Curie use the IGA-002 to investigate complex aging phenomena of glassy films through automated control of the solvent vapor pressure and resultant desorption/resorption isotherms. (Doumenc et al, European Physical Journal E 27 (2008) 3, DOI:10.1140/epje/i2008/10345-0)

"Perovskite membrane reactor for continuous and isothermal redox hydrogen production from the dissociation of water"

The redox properties of synthesised perovskite ($\text{La}_{0.3}\text{Sr}_{0.7}\text{FeO}_3$) materials have been investigated at the Greek Center for Research and Technology – HELLAS, using the IGA-003 with an integrated mass spectrometer. (Evdou et al, Journal of Membrane Science 325 (2008) 704, DOI:10.1016/j.memsci.2008.08.042)

Take the Strain out of your Sorption Measurements

Hidden Isochema's new sample environment manipulator arm allows the simple, rapid exchange of IGA sample environment accessories with the minimum of effort.

The manipulator arm lifts the environmental jacket into place around the IGA reactor tube at the touch of a button. Quick release locating pins ensure that the same precise x-y positioning is always achieved, while a motion limiter and personnel interlocks guarantee safe operation at all times.

Our manipulator arm is fully compatible with all IGA sample environment options and interchange between accessories is quick and straightforward.

Furthermore, the IGA sample environment manipulator arm is fully reverse compatible!

Contact us now for further details...



THE Educational Resource for Sorption Science

Don't forget that the Hidden Isochema website www.hiddenisochema.com is THE Educational Resource for Sorption Science. In the Library section you can find academic references from a wide range of sorption science areas, details of posters, theses and other publications, and also our glossary of sorption analysis terms for new students.

Set your browser to isochema.com/science to find out more!



Enhancement of H₂ adsorption in Li⁺ - exchanged co-ordination framework materials

Featured on the front cover of the 14 December 2008 issue of ChemComm, researchers from the Universities of Nottingham and Newcastle (UK) recently reported the synthesis, characterisation and hydrogen storage properties of a lithium ion exchanged co-ordination framework with enhanced sorption capacity for the Li⁺ exchanged material [1].

Co-ordination frameworks are potentially attractive hydrogen storage materials as they exhibit reversible hydrogen adsorption with fast kinetics. Lithium doping is of particular interest as it may increase the binding energy of molecular hydrogen and therefore increase the overall hydrogen storage capacity of the co-ordination framework.

Sorption analyses of both the original and Li⁺ exchanged complexes were performed using an IGA-003 instrument at the

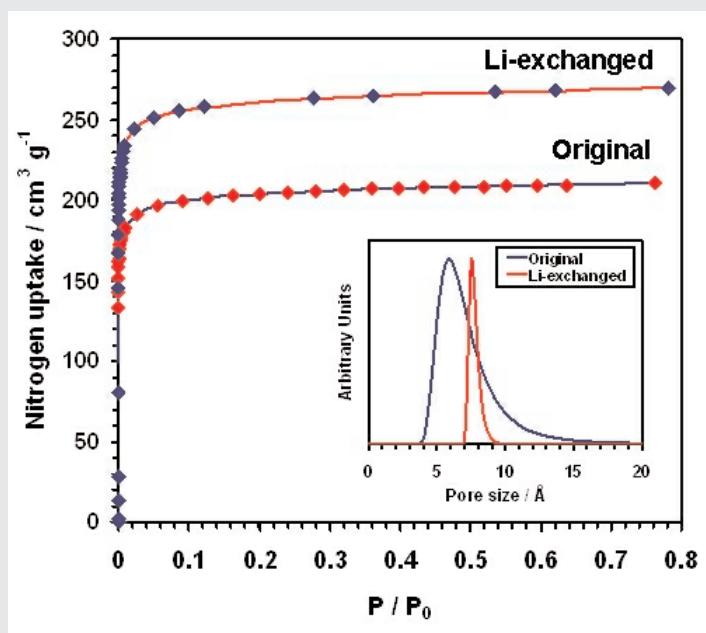


Figure 1: Nitrogen sorption isotherms at 77 K with pore size distribution analyses (inset).

University of Nottingham. The pore distribution was evaluated by applying Dubinin-Astakhov analysis to the nitrogen data and is shown in Figure 1. The nitrogen sorption data show that the Li⁺ exchanged complex is more porous and has a potentially higher adsorption capacity than the original complex.

Hydrogen sorption data was measured in the range 0 – 20 Bar at 77 and 87 K for both complexes and showed full reversibility, no hysteresis and rapid kinetics in all cases (see Figure 2). The Li⁺ exchanged framework exhibits enhanced hydrogen uptake at both 77 and 87 K, with the gravimetric hydrogen uptake at 0.1 MPa increasing from 1.39 wt% to 1.66 wt% and the uptake at 2 MPa increasing from 2.36 wt% to 2.88 wt% in the case of the 77 K data.

[1] S. Yang, X. Lin, A. J. Blake, K. M. Thomas, P. Hubberstey, N. R. Champness and M. Schröder, ChemComm, 2008, 6108-6110. DOI: 10.11039/b8144155j

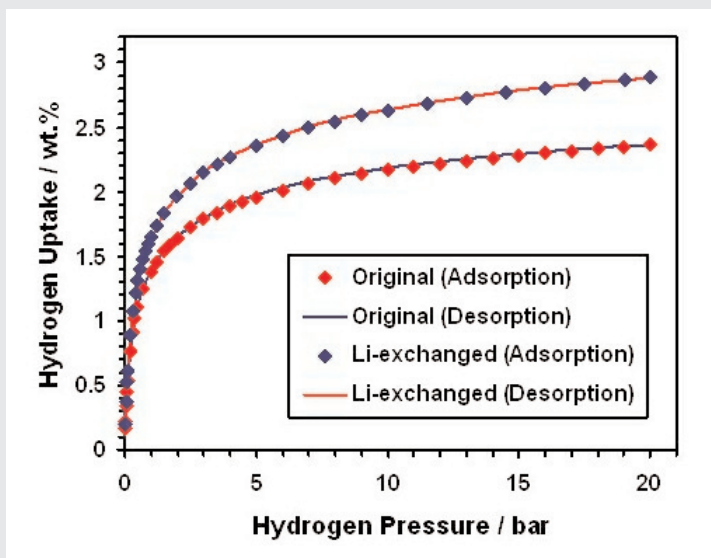


Figure 2: Hydrogen sorption isotherms at 77 K exhibiting enhanced uptake for the Li-exchanged framework.

Framework	BET SSA / m ² g ⁻¹	Pore volume / cm ³ g ⁻¹	Mode pore size / Å	H ₂ uptake at 1 bar / wt%	H ₂ uptake at 20 bar / wt%
Original	820	0.326	5.8	1.39	2.36
Li ⁺ exchanged	1024	0.419	7.0	1.66	2.88

IF YOU REQUIRE INFORMATION OR ADVICE PLEASE CONTACT US: info@hiddenisochema.com

Analytical Instrumentation
Consultancy Services
Bespoke Engineering
Contract Laboratory

Gas & Vapor Sorption
Surface Area & Pore Size
Isotherms & Kinetics
Diffusion and Permeation

Catalyst Characterization
Carbons and Zeolites
Hydrogen Storage
Pharmaceuticals