Hiden Isochema Limited
422 Europa Boulevard, Warrington WA5 7TS
Tel: +44 (0)1925 244 678 info@hidenisochema.com
hidenisochema.com

Release: ISOPR2006 Release date: Immediate

Studying NO_2 adsorption in a MOF using XEMIS sorption analyzers

A research article recently published in Nature Materials [1] reported the selective, reversible adsorption of NO_2 by a metal-organic framework, MFM-300(Al), measured with a Hiden Isochema XEMIS-001 gravimetric sorption analyzer.

Nitrogen dioxide, NO_2 is produced and released by burning fossil fuels in internal combustion engines and other industrial processes, and is a significant atmospheric pollutant. Adsorption of nitrogen dioxide offers a potential route to NO_2 removal, but previously studied sorbents have shown relatively low NO_2 adsorption capacity and often also irreversible uptake.

The authors used a XEMIS-001 gravimetric sorption analyzer to measure the interaction of nitrogen dioxide with a metal-organic framework (MOF) developed at the University of Manchester, UK. The material showed high and selective uptake for NO_2, which was shown to be fully reversible over several adsorption-desorption cycles.

Dr Sihai Yang, one of the study's lead authors and a Lecturer in Inorganic Chemistry at the University of Manchester, UK, said: "Despite the highly reactive nature of nitrogen dioxide, our material proved extremely robust. It is the first example of a metal-organic framework that exhibits a highly selective and fully reversible capability for repeated separation of nitrogen dioxide from the air, even in presence of water."

Professor Martin Schröder, another lead author from the School of Chemistry at the University of Manchester, commented, "Other studies of different porous materials found that they were unstable and decomposed with nitrogen dioxide, or that the regeneration process was too difficult and costly."

Hiden Isochema's Sales and Marketing Director, Dr Mark Roper said: "We are delighted to read this publication from our customers and learn more about the environmentally beneficial applications for this material and MOFs in general. It is especially pleasing to see XEMIS gravimetric sorption analyzers being used in such an important area and contributing to cutting edge research."

About Hiden Isochema

Hiden Isochema is recognized as an established leader in sorption instrumentation with over 20 years' experience in sorption analyzer design and development. For further information on this or any other Hiden Isochema product contact Hiden Isochema at info@hidenisochema.com or visit www.hidenisochema.com

[1] Reversible adsorption of nitrogen dioxide within a robust porous metal-organic framework
X. Han, H. G. W. Godfrey, L. Briggs, A. J. Davies, Y. Cheng, L. L. Daemen, A. M. Sheveleva, F. Tuna, E. J. L. McInnes, J. Sun, C. Drathen, M. W. George, A. J. Ramirez-Cuesta, K. M. Thomas, S. Yang and M. Schröder
Nature Materials 2018. DOI: 10.1038/s41563-018-0104-7