ANALYZER
HIDEN ISOCHEMA NEWSLETTER
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CELEBRATING 15 YEARS OF SUCCESSFUL COLLABORATION

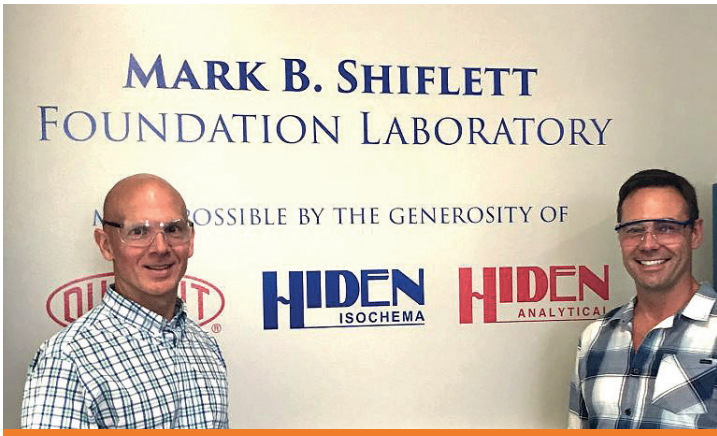
Professor Mark Shiflett, Foundation Distinguished Professor in the Department of Chemical and Petroleum Engineering at the University of Kansas, recently visited the head office of Hiden Isochema, to mark 15 years of successful collaboration.

"Hiden has been an excellent company to work with and offers outstanding equipment and technical service. My students are accurately measuring gas and vapor solubility in advanced materials such as ionic liquids, zeolites and carbons using Hiden's instruments which are leading to new discoveries."

In early September, Prof. Shiflett attended the 21st European Conference on Thermophysical Properties in Graz, Austria, to give an invited talk on 'Ionic Liquids – Phase Behavior to Applications.' We were very pleased that Prof. Shiflett then chose to extend his stay in Europe to visit us here in Warrington to discuss our continued collaboration that has so far lasted 15 years.

During his visit, we gave Prof. Shiflett a tour of our facilities, which allowed a detailed discussion of how we could further develop the strong links between the new Shiflett Foundation Laboratory at the University of Kansas and Hiden Isochema. We were honoured to be able to help Prof. Shiflett establish his new laboratory, which is based within the Center for Environmentally Beneficial Catalysis (CEBC).

The CEBC focuses on green chemistry and the application of green engineering principles. Its aims are to develop cost-effective processes to produce chemicals needed by a variety of industries, whilst striving to reduce waste and



Professor Mark Shiflett (left) **and Gerard Duffy** (Hiden Inc. USA) **at the opening of the new laboratory**

Dr Mark Roper (Hiden Isochema) **demonstrates the IMI analyzer to Professor Mark Shiflett**

conserve natural resources. Hiden Isochema gravimetric sorption analyzers aid these efforts by allowing the thermodynamic and kinetic characterization of gas and vapor interactions with ionic liquids and solid sorbents, such as zeolites and porous carbons.

Prof. Shiflett was appointed to his current position at the University of Kansas last year, following 28 extremely successful years at DuPont. He holds 44 US patents and is author of over 75 academic publications, 30 of which report data measured using Hiden Isochema gravimetric sorption analyzers. He has received a number of awards, including the 2016 AIChE Industrial Research and Development Award for developing non-ozone depleting refrigerants, which have led to the healing of the earth's ozone layer, and he is also a Fellow of the AIChE. We feel privileged to be able to support Prof. Shiflett in his continued efforts to develop new technologies that will have real world impact.

To find out more about how our instruments could help you achieve your own research goals, please do not hesitate to contact us at info@hidenisochema.com.

"We are delighted to have the opportunity to continue working with Professor Shiflett and to help establish the Shiflett Foundation Laboratory at The University of Kansas. Our ongoing collaboration will help further develop our business and raise the profile of Hiden sorption analyzers both in the U.S. and internationally."

Shiflett group members Dr David Minnick, Alejandra Rocha and Tugba Turnaoglu.

PUBLICATION ROUND-UP

Wood

Short hold times in dynamic vapor sorption measurements mischaracterize the equilibrium moisture content of wood

S. V. Glass, C.R. Boardman and S. L. Zelinka

Wood Science Technology (2017) 51:243-260

Researchers at the US Forest Service's Forest Products Laboratory use an IGAorp dynamic water vapor sorption analyzer to thoroughly investigate the equilibrium and kinetics of interactions between water vapor and wood samples. The effect on the plotted equilibrium moisture content of using fixed time or simple dm/dt equilibration criteria is demonstrated to be significant. The authors illustrate the importance of studying the sorption kinetics for a sufficient duration, using a rigorous kinetic model based on exponential kinetics to predict the equilibration endpoint, and ensuring stable temperature and humidity control throughout the measurements.

MOFs

Porous Metal–Organic Polyhedral Frameworks with Optimal

Molecular Dynamics and Pore Geometry for Methane Storage

Y. Yan, D. I. Kolokolov, I. da Silva, A. G. Stepanov, A. J. Blake, A. Dailly, P. Manuel, C. C. Tang, S. Yang and M. Schröder

Journal of the American Chemical Society (2017) DOI:10.1021/jacs.7b05453

The methane storage capacity of a family of novel metal-organic framework (MOF) materials was studied by collaborators in the UK, Russia and the USA. The MOFs, synthesised at the University of Manchester, UK, were dynamically and structurally characterised with NMR and neutron scattering techniques, whilst the CH4 gas adsorption properties were measured in the range 0 to 90 bar using a XEMIS gravimetric sorption analyzer. The best performing material, MFM-115a, is shown to exhibit exceptionally high deliverable methane storage capacity cycling between 5 and 80 bar at ambient temperature.

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