

Low pressure, precision porosity measurements in ultra-microporous range

Porosity tuning to drive and optimize storage capacity of molecules in MOFs research

NORCROSS, GEORGIA, UNITED STATES, June 30, 2020 /EINPresswire.com/ -- Micromeritics Instrument Corp., a global leader in material characterization technologies, enables scientists to

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Dr. Jeff Kenvin

generate required data to confidently and efficiently exploit the full potential of metal-organic frameworks (MOFs). The Micromeritics 3Flex surface and catalyst characterization system allows for low pressure, precision porosity measurements in the ultra-microporous range, down to a pore size of 0.35 nm. This helps identify and measure the size of ‘pockets’ available for storage and the ease-of-transfer of target molecules that define a MOFs’ utility. The 3Flex also allows researchers to assess adsorption affinity with both gases and vapors. System specifications ensure chemical compatibility with a large library of materials for industrially relevant screening.

Porosity measurements, including pore size distribution and pore volume, quantify the internal structure of a [MOF](#). By tuning porosity, researchers can optimize storage capacity for a specific molecule, achieve separation by engineering a crystalline network that preferentially retains or slows the rate of transition of a certain species. In addition, it helps optimize the localized reaction environment by controlling the ease with which reactants and products move to and from active catalytic sites.

The commercial use of MOFs includes applications in fruit packaging and for the storage of toxic dopants for the semiconductor industry. Precise, accurate analytical data drive this development with researchers relying on a core set of characterization tools to:

- Refine synthesis knowledge, to establish secure correlations between reaction conditions and the defining features of the resulting MOF
- Verify that a synthesized MOF has the expected properties and that a synthesis route is repeatable, essential for quality control (QC)
- Correlate the properties of MOFs with their suitability for a specific application, to rank and

optimize potential candidates and guide further development

The 3Flex is a fully automated high-resolution micropore analyzer with three independent analysis ports designed for a variety of measurements that can benefit:

- □ [Physisorption](#) determination of
 - o Surface area
 - o Micro- and Mesopore volume, and size distribution
 - o Heat of Adsorption
- Vapor adsorption to e.g. receive a better insight into surface polarity
- Dynamic and static [chemisorption](#) to obtain valuable information about the active properties of a material

Users of the instrument also benefit from a comprehensive database with adsorptive properties and Density-functional theory (DFT) models. "Its complementary flexibility for vapor adsorption studies, surface area measurement, and chemisorption analyses makes the Micromeritics 3Flex surface and catalyst characterization system a core instrument in MOFs laboratories across the globe.", says Dr Jeff Kenvin, Micromeritics' Director Technology and Application Consulting.

More information on the Micromeritics 3Flex surface and catalyst characterization system and how it lets you quickly switch from physisorption to chemisorption analysis in minutes can be obtained [here](#).

About Micromeritics Instrument Corporation



Micromeritics 3Flex surface and catalyst characterization system



Micromeritics

Micromeritics Instrument Corporation is a global provider of solutions for material characterization with best-in-class instrumentation and application expertise in five core areas: density; surface area and porosity; particle size and shape; powder flow and bulk characterization; and catalyst characterization and process development.

The company is headquartered in Norcross, Georgia, USA and has more than 400 employees worldwide. With a fully integrated operation that extends from a world-class scientific knowledge base through to in-house manufacture, Micromeritics delivers an extensive range of high-performance products for oil processing, petrochemicals and catalysts, to food and pharmaceuticals, and works at the forefront of characterization technology for next-generation materials such as graphene, metal-organic-frameworks, nanocatalysts, and zeolites.



Dr. Jeff Kenvin, Micromeritics' Director Technology and Application Consulting.

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