

Micromeritics delivers unique, high productivity catalyst evaluation unit to researchers at ETH Zurich

Accelerating the development of innovative catalysts for sustainable, eco-efficient processes

NORCROSS, GEORGIA, UNITED STATES, April 21, 2020 /EINPresswire.com/ -- Micromeritics Instrument Corp., a leader in material characterization technology, has delivered a bespoke high productivity catalyst evaluation unit, the Micromeritics Multi Catalyst Reactor 4 – MR-4, to the advanced Catalysis engineering (aCe) group at ETH Zurich (Switzerland) to accelerate work on heterogeneous catalysts that address environmental and energy challenges. The group is led by Professor Javier Pérez-Ramírez, a prize-winning chemical engineer renowned for his work in this field. The new unit allows the group to generate high-quality data at an unprecedented rate to enable the application of ‘digital’ [catalyst development](#), machine-learning algorithms, and advanced statistical modelling to accelerate progress.



High productivity catalyst evaluation unit
Micromeritics Multi Reactor MR-4

“Digital catalyst development is in its infancy,” said Professor Pérez-Ramírez “but to unlock its potential we need to generate significant quantities of high-quality kinetic data. The new catalyst evaluation rig was acquired to deliver a step-change in our catalyst testing rate. The unit has four reactors that can simultaneously test four different catalysts or, alternatively, generate multiple data points for promising candidates. Our experimental throughput has now risen to a level of around 20 – 24 catalysts or 60 – 120 kinetic data points for each catalyst per week.”

“

I’ve used Micromeritics products for a decade and working with the company on this project was always a pleasant experience”

Professor Javier Pérez-Ramírez, (aCe) group at ETH Zurich

The aCe group has been working with Total S.A., the French multinational energy company, to develop a catalytic process for the efficient conversion of carbon dioxide, a waste gas, to methanol, a core chemical building block. The expansion of the carbon dioxide valorization program was a motivating factor for investing in a new unit.

Micromeritics was selected to design and build the new reactor system following a rigorous

assessment of different suppliers. Key to this decision was the company's engineering expertise and the demonstrated functionality of proprietary software.

"I knew exactly what I wanted this unit to be able to do and the demands associated with the chemistry we operate," said Professor Pérez-Ramírez. "A key problem that Micromeritics solved was to allow us to sample all the reactors in a timely way using just a single existing analyzer and the software is extremely robust and professional. The interface we have resembles what you would find in a commercial plant control room and its functionality directly underpins our efficiency."

Micromeritics has extensive experience of building bespoke equipment for customers, from tailored analytical units through to complete pilot plants.

The design of the ETH Zurich unit means that samples are extracted from each reactor early in an experiment, to avoid missing critical events, and then effectively 'queued'. This innovative solution avoids the need for dedicated gas chromatographs for each reactor. The integral software handles the large quantities of data generated extremely effectively. Key parameters such as selectivity, conversion and yield are displayed in real time and there is considerable flexibility to tailor reporting to experimental requirements. These capabilities boost efficiency, allowing researchers to change conditions in response to observed results, even during a run.

"I've used Micromeritics products for a decade and working with the company on this project was always a pleasant experience," said Prof Pérez-Ramírez "They are real experts in their field, but at the same time highly collaborative. We're delighted with the new unit and the contribution it is already making to our research."

About Micromeritics Instrument

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 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. Cost-efficient contract testing is offered via its laboratory Particle Testing Authority (PTA).

The strategic acquisitions of Freeman Technology Ltd and Process Integral Development S.L. (PID Eng & Tech) reflect an ongoing commitment to optimized, integrated solutions in the industrially vital areas of powders and catalysis.



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