

Sasol uses microreactor sample environment for catalysis research

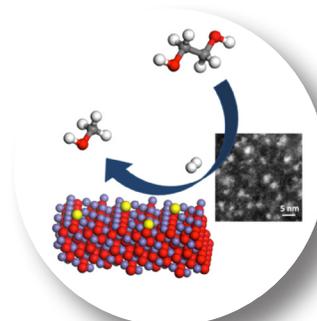
The Problem

A proper understanding of structure-property relationships plays a central role in the design and discovery of novel materials. In many cases, exploring the relationship between the structure of a new material and its physical and chemical properties requires that measurements are carried out under exactly the same in situ conditions of temperature, pressure and atmosphere as the performance environments of the material of interest.



The Challenge

Catalyst characterisation under real operating conditions provides a unique opportunity for industrial researchers to develop new, challenging materials for energy, chemistry and environmental technologies. Therefore, it is crucial to promote the expansion of effective and profitable collaborations and provide access to high technology facilities such as Diamond equipped with a range of customised sample environments.



The Solution

A gas flow reactor was recently developed and commissioned at Diamond. This sample environment is a generic cell with temperature control and gas mixing switching capabilities which covers a wide range of catalytic processes. This set up allows us to mimic operating conditions and, at the same time, give the flexibility to be able to study the catalyst's structural properties by a wide range of techniques. The reactor is compatible with combinations of X-ray absorption spectroscopy, mass spectrometry and X-ray diffraction measurements under time-resolved, in situ conditions.

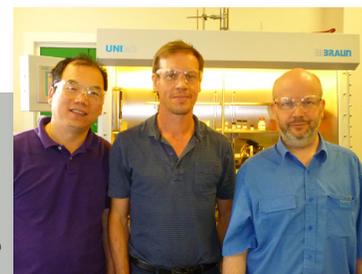


The Benefits

The gas flow reactor has been successfully used by several industrial users in the field of catalysis. The set up was used to provide the ideal conditions for mimicking real industrial processes thereby aiding the development of new materials.

"Gaining access to world class facilities at Diamond has provided a level of fundamental understanding of our catalytic materials that would not be possible with conventional lab-based techniques. This greater scientific understanding is essential to the development of next generation materials and processes. The success of our first XAS measurements would not have been possible without collaboration with the Industrial Liaison team, a group of exceptional scientists with vast knowledge and expertise."

Dr Paul Webb, Sasol Technology (UK) Ltd



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