UNIVERSIDAD AUTÓNOMA METROPOLITANA
UNIDAD IZTAPALAPA

Departamento de Química

Conferencias, lunes 16 de mayo 2016

Dr. Thomas Chamberlain

"Carbon Nanoreactor Stabilised Heterogeneous Catalysts"

My research focuses on the application of carbon nanostructures, including fullerenes, carbon nanotubes, graphitised carbon nanofibres and graphitised mesoporous carbon as active supports for heterogeneous catalysis. The nanosized features of nanostructured carbon, well-defined channels and/or pores, can be tailored to encapsulate molecular and nanoparticulate catalysts. The dimensions of these pores and channels in CNS, 1-50 nm, are also ideal sterically confined environments for performing controlled chemical reactions with the extreme confinement imposed directing the formation of new materials and causing changes in selectivity for established reactions. I exploit both batch and continuous flow chemistry to screen and optimise the application of these novel catalyst in a variety of industrially focused processes including biomass valorisation and fine chemical synthesis.

I am also interested in understanding the structure of catalytic materials down at the atomic level and using solid state analytical techniques including aberration corrected high resolution electron microscopies (AC-HRTEM and STEM), X-ray absorption and diffraction and gas adsorption to elucidate the exact structure of materials. By monitoring both the formation of heterogeneous catalysts from metallic precursors and the structure of the catalyst during chemical reactions using a combination of *in situ* HRTEM and near edge X-ray absorption fine structure (NEXAFS) experiments it is possible to reveal atomic level structural information and mechanistic details of how the catalysts function.

For more details see my webpage:

http://www.chem.leeds.ac.uk/People/Chamberlain.html

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Dr. Bao N. Nguyen

"Mechanistically guided improvement of catalytic reactions: transfer hydrogenation and CO_2 utilisation"

Catalytic reactions are indispensable tools in modern organic synthesis with unmatched selectivity and functional group compatibility compared to traditional organic chemistry However, many catalytic reactions in academia are not suitable for industrial application in High Value Chemical Manufacture (HVCM). Research in my group focuses on utilising mechanistic understanding and reaction engineering to address these challenges.

In this talk, I will present two case studies wherein mechanistic insights led to decisive solutions to overcome challenges in two important industrial reactions: transfer hydrogenation of ketones using an immobilised Cp*Ir catalyst and organoccatalysed functionalisation/reduction of CO_2.

Further information on my current research can be found at: http://www.chem.leeds.ac.uk/bao-nguyen