Australian Synchrotron
USER MEETING 2014
20 – 21 November
National Centre for Synchrotron Science

Contribution ID : **69** Type : **Oral**

Using Flexible MOFs to Study Inorganic Reactivity

Friday, 21 November 2014 12:25 (20)

Metal-organic frameworks (MOFs) are crystalline materials that can be synthesised from metal ions or metal-oxide clusters (nodes) and organic building blocks (links).[1] Through careful consideration of the chemistry of the organic links the properties of these materials can be tailored for particular applications. For example, a flexible framework capable of high yielding post-synthetic metallation[2] can be synthesised.[3] Remarkably, this material (MnMOF) is able to provide structural insight into inorganic reactivity through single crystal X-ray crystallography (SCXRD).[3]

This presentation will describe the structure of this new 3D MOF, which possesses pore cavities that are lined with vacant di-pyrazole groups poised for post-synthetic metallation. As part of this I will illustrate the potential of this platform MOF to provide fundamental insight into metal-catalysed reactions in porous solids. For example, SCXRD studies undertaken partly at the Australian Synchrotron, reveal the reaction products of consecutive oxidative addition and methyl migration steps that occur within the pores of a Rh metallated example, MnMOF-[Rh(CO)2][Rh(CO)2Cl2].

[1] H. Furukawa, K.E. Cordova, M. O'Keeffe and O.M. Yaghi, Science, 2013, 341, 974.
[2] J.D. Evans, C.J. Sumby and C.J. Doonan, Chem. Soc. Rev., 2014, 43, 5933-5951.
[3] W.M. Bloch, A. Burgun, C.J. Coghlan, R. Lee, M.L. Coote, C.J. Doonan, and C.J. Sumby, Nat. Chem., 2014, doi:10.1038/nchem.2045.

Keywords or phrases (comma separated)

MOFs, structural inorganic chemistry, post-synthetic reactions, organometallic chemistry

Summary

Primary author(s) : Dr SUMBY, Chris (University of Adelaide)

Presenter(s) : Dr SUMBY, Chris (University of Adelaide)

Session Classification : Energy Materials

Track Classification : Energy Materials