METAL-ORGANIC FRAMEWORKS WITH ZERO-VALENT METAL NODES

James N. McPherson, Carl Emil Andersen, Olivia Bue Vest, Xiyue Liu, Kasper S. Pedersen

Department of Chemistry, Technical University of Denmark, Kgs. Lyngby, Denmark

Despite the tremendous attention that has been paid to metal-organic frameworks (MOFs) over the last few decades, with very few exceptions,[1] all have been constructed from anionic ligands and metal ions or clusters in moderate to high oxidation states. These structural motifs are vastly different to those encountered in organometallic chemistry. While a plethora of methods for the synthesis of conventional MOFs have been discovered and developed, most of these approaches are incompatible with the more covalent nature of the interactions between charge neutral ligands and low- or zero-valent metal centres.

Our advances to the development of such zero-valent metal organic frameworks will be presented.[2,3]

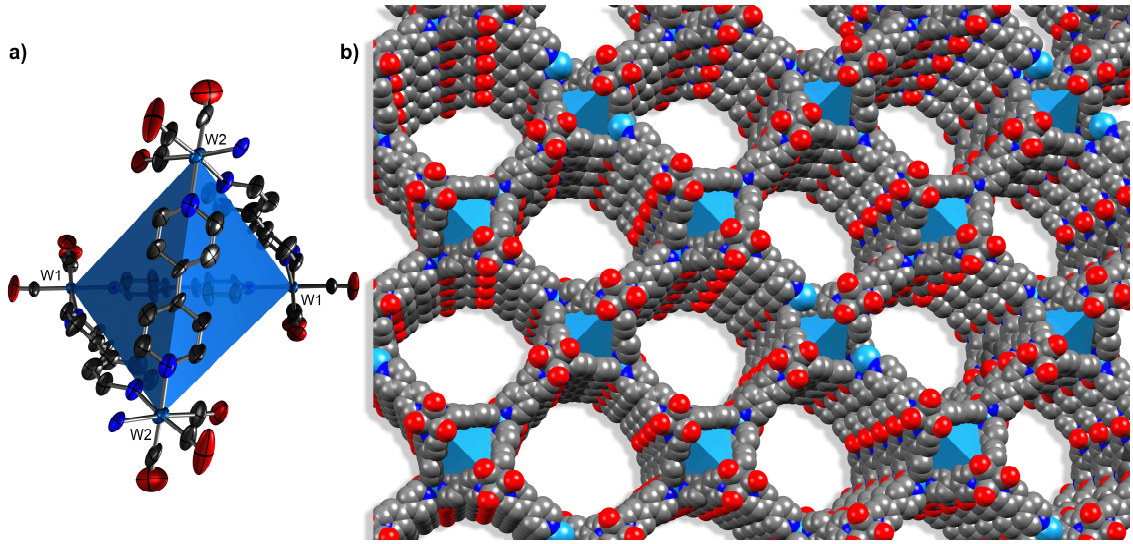

Figure 1. Views from the 3D-ED structure of *fac*-$W(CO)_3(bipy)_{3/2}$ MOF (bipy = 4,4′-bipyridine) showing (a): the tetrahedral secondary building units, and (b) one of the four interpenetrated extended 3D networks.[3]

[1] R. E. Sikma, S. M. Cohen, *Angew. Chem. Int. Ed.* **2022**, *61*, e202115454. DOI: 10.1002/anie.202115454

[2] L. Voigt, R. W. Larsen, M. Kubus, K. S. Pedersen, *Chem. Commun.*, **2021**, *57*, 3861-3864. DOI: 10.1039/D1CC00864A

[3] C. E. Andersen, J. N. McPherson, M. Giménez-Marqués, M. Kubus, S. Ito, C. R. Göb, R. W. Larsen, G. M. Espallargas, K. S. Pedersen, *preprint*, **2023**, DOI: 10.26434/chemrxiv-2023-xp3qq