

MS31-02 | DYNAMIC MOFs WITH BREATHING-DEPENDENT REDOX BEHAVIOR

Minguez Espallargas, Guillermo (ICMol, University of Valencia, Paterna, ESP); Souto, Manuel (ICMol, University of Valencia, Paterna, ESP); Vicent-Morales, Maria (ICMol, University of Valencia, Paterna, ESP)

Flexible or “breathing” Metal-Organic Frameworks (MOFs) involving changes in their physical and structural properties upon an external stimulus are an interesting class of crystalline materials due to their range of potential applications including chemical sensors.[1] Recently, we have reported the use of a tetrathiafulvalene (TTF)-based ligand and trimeric Fe₃O SBUs to yield a highly stable MOF, namely **MUV-2**, with non-interpenetrated hierarchical crystal structure and an enhanced catalytic activity.[2] This MOF shows a continuous breathing behaviour with a reversible swelling upon solvent adsorption, which affects the planarity of the TTF linkers. This breathing behaviour directly impacts on its electrochemical properties and thus opens the way for the development of new electrochemical sensors.[3] On the contrary, the interpenetrated analogue, **MUV-2-i**, shows a reduced breathing capacity.[4]

[1] A. Schneemann, V. Bon, I. Schwedler, I. Senkovska, S. Kaskel and R. A. Fischer, *Chem. Soc. Rev.*, 2014, **43**, 6062.

[2] M. Souto, A. Santiago-Portillo, M. Palomino, I. Vitorica-Yrzebal, B. J. C. Vieira, J. C. C. Waerenborgh, S. Valencia, S. Navalon, F. Rey, H. Garcia and G. Minguez Espallargas, *Chem. Sci.*, 2018, **9**, 2413.

[3] M. Souto, J. Romero, J. Calbo, I. J. Vitorica-Yrezabal, J. L. Zafra, J. Casado Cordón, E. Ortí, A. Walsh and G. Minguez Espallargas, *J. Am. Chem. Soc.*, 2018, **140**, 10562.

[4] M. Vicent-Morales, I. J. Vitorica-Yrezabal, M. Souto, G. Minguez Espallargas, *CrystEngComm* 2019, **21**, 3031.