

## Conducting tetrathiafulvalene-based coordination networks

Damien Bechu,<sup>a</sup> Lilia Xie,<sup>b</sup> Stéphane Baudron,<sup>a</sup> Nolwenn Le Breton,<sup>c</sup> Sylvie Choua,<sup>c</sup> Mircea Dinca,<sup>b</sup> Mir Wais Hosseini.<sup>a</sup>

<sup>a</sup> Université de Strasbourg, UMR-CNRS 7140, Laboratoire de Tectonique Moléculaire, 4 rue Blaise Pascal, 67000 Strasbourg, France

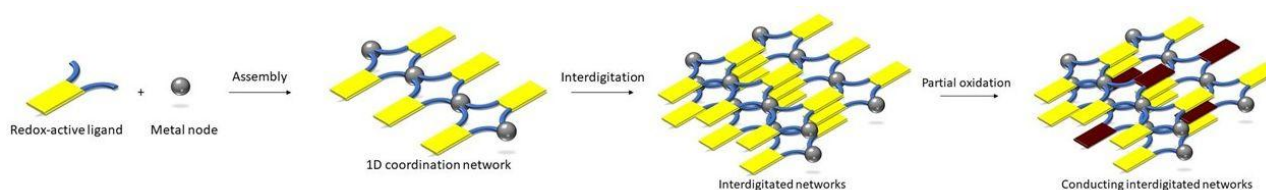
<sup>b</sup> Department of Chemistry, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, Massachusetts 02139, United States

<sup>c</sup> Université de Strasbourg, UMR-CNRS 7177, Laboratoire POMAM, 4 rue Blaise Pascal, 67000 Strasbourg, France

[damien.bechu@etu.unistra.fr](mailto:damien.bechu@etu.unistra.fr)

Metal organic frameworks (MOFs) have been developed over the past few decades for various applications such as gas sorption, separation and catalysis.<sup>1–3</sup> More recently, they have also been investigated for their use in the area of opto-electronic and electronic devices.<sup>4</sup> Thus, attention has been drawn to the design of MOFs featuring magnetic properties, luminescence or electronic conductivity.<sup>5–7</sup> In this context, several approaches for charge transport in conducting MOFs have been studied,<sup>5</sup> in particular aiming at either hopping or band transport. Conductivity by band transport or “through space” can be generated using organic linkers which are redox active and prone to stacking, such as tetrathiafulvalene (TTF).

In this contribution, we will present our strategy to control the relative arrangement of TTFs in a MOF using the principles of molecular tectonics.<sup>8</sup> Our strategy relies on the formation of 1D neutral coordination polymers, the promotion of their interdigitation (Figure 1) and their partial oxidation for the elaboration of a conductivity pathway. The synthesis and characterization of one material will be discussed.



**Figure 1** Strategy for the formation of a conducting interdigitated TTF-MOF

1 Y. He, W. Zhou, G. Qian and B. Chen, *Chem. Soc. Rev.*, **2014**, *43*, 5657–5678.

2 J.-R. Li, J. Sculley and H.-C. Zhou, *Chem. Rev.*, **2012**, *112*, 869–932.

3 P. García-García, M. Müller and A. Corma, *Chem. Sci.*, **2014**, *5*, 2979–3007.

4 V. Stavila, A. A. Talin and M. D. Allendorf, *Chemical Society Reviews*, **2014**, *43*, 5994–6010.

5 L. Sun, M. G. Campbell and M. Dinca, *Angew. Chem. Int. Ed.*, **2016**, *55*, 3566–3579.

6 Y. Cui, Y. Yue, G. Qian and B. Chen, *Chemical Reviews*, **2012**, *112*, 1126–1162.

7 P. Dechambenoit and J. R. Long, *Chem. Soc. Rev.*, **2011**, *40*, 3249–3265.

8 M. W. Hosseini, *Acc. Chem. Res.*, **2005**, *38*, 313–323.