TOWARDS TEREPHTHALONITRILE RADICAL-BRIDGED METAL-ORGANIC FRAMEWORKS

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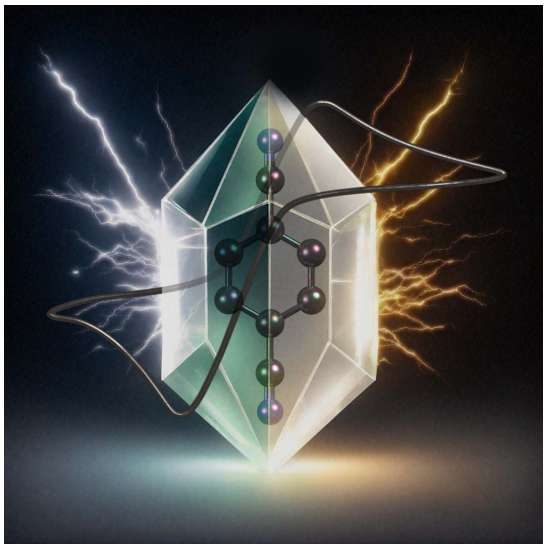
Organonitrile compounds have received significant attention for their application as organic ligands in coordination polymers and metal-organic frameworks (MOFs), thanks to their potential to mediate strong interactions between neighbouring metal ions via electron delocalisation in π-conjugated systems. Thereby, such networks can exhibit interesting conductive and, or magnetic properties, while retaining relatively large metal-metal distances, leading to lightweight and porous materials in which properties can be modulated using interactions between the framework and guest species within the pores. [1]

Terephthalonitrile (tpn) particularly, which is composed of a benzene ring with two cyano groups in the 1- and 4-positions, is a promising candidate, thanks to its ability to form stable radicals [2], in which an extra electron, delocalised in the π-conjugated system, facilitates a strong increase in metal-ligand interactions, as has been shown previously in metal-radical materials. [3]



Graphical Abstract*: Redox-active bridging ligand: Terephtalonitrile*

This presentation will discuss the synthesis and characterisation of different tpn radical ($tpn^{\bullet-}$) salts, and their application as reduction agent and, or bridging ligand in metal organic frameworks (MOFs).

[1] Allendorf, M.D, et al., *Chem. Eur. J.* **2011**, 17: 11372-11388.

[2] Suo, M. et al., *Chem. Commun*, **2025**, 61, 9972

[3] Ma, X., et. al., *Angew. Chem. Int. Ed.* **2018**, 57, 7841.