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Molecular trapping by flexible coordination polymers with latent porosity

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Adsorption of gases and vapours, and solid-state reactions, involving crystalline materials are areas of considerable interest. Crystalline materials can thereby be engaged in catalysis, energy storage, separation and sensing applications. The study of such behaviour often requires the application of crystallography combined with other experimental (and computational) methods to obtain a complete understanding. In this presentation, related families of coordination polymers will be discussed. The materials exhibit flexibility in the crystalline state and have been shown to reversibly absorb a variety of small molecules from the vapour phase, including alcohols and arenes, as well as gases.[1,2] The trapped molecules can be located crystallographically within the crystals and have been shown to bind either covalently, through metal-ligand bond insertion reactions, or non-covalently. A series of studies will be described, including reversible single-crystal-to-single-crystal reactions, in situ powder diffraction and spectroscopic studies. The studies involve both laboratory and synchrotron diffraction studies.

[1] *S. Libri, M. Mahler, G. Mínguez Espallargas, D. C. N. G. Singh et al., Angew. Chem. Int. Ed, 2008, 47, 1693-1697.,* ***[2]*** *I. J. Vitórica-Yrezábal, G. Mínguez Espallargas, J. Soleimannejad et al., Chem. Sci., 2013, 4, 696-708.*

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