crystal size and morphology over the resulting CORMAs properties including payload, CO-delivery and matrix stability have been evaluated.[2] Finally, we have also prepared novel NORMAs improving NO adsorption on the MOF $[Ni_8(OH)_4(H_2O)_2(BDP)_6]$ (H_2BDP=1,4-bis(pyrazol-4-yl) benzene-4) through the sequential introduction of missing-linker defects and extra-framework Fe^{2+} cations in this robust porous structure. In addition, a cation exchange strategy has been used with the same purpose on the cationic biocompatible MOF $(NH_2(CH_3)_2)_2[Zn_8(adeninate)_4(BPDC)_6]$ (BPDC = 4,4′-biphenyldicarboxylate). The NO releasing ability of these new NORMAs as well as their stability under physiological conditions have been compared.

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MS35-O2

Tuning properties and functionality in modulated crystallisation of high-valent metal-organic frameworks

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Metal-organic frameworks (MOFs) are network materials comprised of organic ligands connected by metal ion clusters into multidimensional structures that often have permanent porosity. Their chemically addressable structures, combined with their ability to store large quantities of small molecules within their pores, have led to applications in gas storage, heterogeneous catalysis, sensing, and drug delivery, amongst others. Coordination modulation, the addition of monomeric modulators to synthetic mixtures, can tune particle size from nanometres to centimetres, through capping of crystallites (decreasing) or coordinative competition with ligands (increasing).

The talk will cover the development of our own modulation techniques for high valent MOFs, and the use of modulation to control physical properties such as interpenetration, defectivity, and porosity. Our techniques provide access to high quality single crystals of many different MOFs, allowing the subsequent characterisation of their mechanical properties,[1] single-crystal to single-crystal postsynthetic modification,[2] development of fluorescent sensors,[3] and sequestration of toxic gases.

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