

# Poster Presentations

## [MS24-P30] MOFs with 5Aminoisophthalate & 4,4'-Bipys or a Reduced Schiff Base Dicarboxylate.

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Hydrothermal reactions of the reduced Schiff base 4carboxy-phenylene-methyleneamino-4-benzoic acid ( $\mathbf{L} \text{H}_2$ ) with  $\text{Zn}(\text{OH})_2$  and DPE [1,2-di(4pyridyl)ethylene] afforded a non-porous 2D coordination polymer of the formula  $\{[\text{Zn}_2(\mathbf{L})_2(\text{DPE})] \cdot \text{H}_2\text{O}\}_n$  (**1**). The analogous reaction of  $\mathbf{L} \text{H}_2$  with  $\text{Zn}(\text{OH})_2$  and 4,4'-azopy (4,4'-azopyridine) giving the porous 3D structure  $\{[\text{Zn}_3(\mathbf{L})_3(4,4'\text{azopy})] \cdot 7.5\text{H}_2\text{O}\}_n$  (**2**), which exhibits interesting hysteretic behaviour on  $\text{CO}_2$  adsorption and desorption. The solvothermal reaction of  $\text{Zn}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$  with 5aminoisophthalic acid and 4,4'-bipyridyl (4,4'-bipy) led to the self-assembly of the known 3D hybrid Hbonded/covalent structure  $\{[\text{Zn}(5\text{-AIP})(4,4'\text{bipy})_{0.5}] \cdot \text{DMF}\}_n$  (**3**), but with dimethylformamide (DMF) in this case rather than  $\text{H}_2\text{O}$  as previously [2], with an analogous reaction using the related molecule 4,4'-azopyridine (4,4'-azopy) in place of 4,4'-bipyridyl giving the structurally related framework  $\{[\text{Zn}(5\text{-AIP})(4,4'\text{-azopy})_{0.5}] \cdot \text{DMF}\}_n$  (**4**). Similar solvothermal reactions of  $\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ ,  $\text{Mn}(\text{NO}_3)_2 \cdot 4\text{H}_2\text{O}$  and  $\text{Cd}(\text{NO}_3)_2 \cdot 4\text{H}_2\text{O}$  with 5-aminoisophthalate and the potential linkers 4,4'-bipy, 2-di(4-pyridyl)ethylene (DPE) and 4,4'-azopy afforded the porous 3D structures  $\{[\text{Co}_2(\text{NO}_3)_2(5\text{-AIP})(4,4'\text{-bipy})_2] \cdot 2\text{EtOH}\}_n$  (**5**),  $\{[\text{Co}(5\text{AIP})(\text{DPE})] \cdot 3\text{DMF}\}_n$  (**6**)

and  $\{[\text{Co}(5\text{-AIP})(4,4'\text{azopy})] \cdot 2\text{DMA}\}_n$  (**7**) (DMA = dimethylacetamide)  $\{[\text{Mn}(5\text{-AIP})(4,4'\text{-bipy})] \cdot 2\text{DMA}\}_n$  (**7**),  $\{[\text{Mn}(5\text{-AIP})(\text{DPE})] \cdot 1.5\text{DMF}\}_n$  (**8**),  $\{[\text{Mn}(5\text{-AIP})(4,4'\text{azopy})] \cdot 1.5\text{DMF}\}_n$  (**9**),  $\{[\text{Cd}(5\text{-AIP})(4,4'\text{bipy})] \cdot 3\text{DMF}\}_n$  (**10**), which has been previously reported [2]),  $\{[\text{Cd}(5\text{-AIP})(\text{DPE})] \cdot \text{DMF}\}_n$  (**11**) and  $\{[\text{Cd}(5\text{-AIP})(4,4'\text{-azopy})] \cdot \text{DMF}\}_n$  (**12**), with structures **6-12** bearing the same network topologies with metal atoms and 5-AIP ligands in sheets, with bipy ligands acting as pillars, and solvent molecules around the bipy ligands. Carbon dioxide uptakes for these structures, whilst modest, reveal an interesting pattern, with enhanced uptakes observed for those structures which bear larger pore sizes and polar functionalities. The structures will be discussed and the specific problems associated with MOF crystallography will be explored.

[1] Kongshaug, K.O. and Fjellvåg, H., (2006). *Inorg. Chem.*, 45, 2424-2429.

[2] Wang, H. N., Meng, X., Qin, C., Wang, X. L., Yang, G.S., and Su, Z.M., (2012). *Dalton Trans.*, 41, 1047-1053.

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