

Crystal Engineering of Metal-organic Frameworks using 4,4'-Dipyridyl-N,N'-Dioxide

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Hybrid organic-inorganic materials provide the possibility of combining the advantages of organic and inorganic substances [1]. Schröder *et al* reported [2] that several terbium (III) coordination polymers of differing stoichiometry can be prepared by means of diffusion solvent mixtures using 4,4'-dipyridyl-N,N'-dioxide (dpdo). We have been investigating the coordination polymers of gadolinium (III) and thallium (III). Crystal structures acquired had either zigzag diamondoid or ladder shapes.

The study of metal-organic frameworks (MOF) has been extended to transition elements such as CuCl_2 , ZnBr_2 , $\text{Zn}(\text{NCS})_2$ and PbCl_2 . We have found that changing the metal geometry, while using the same spacer ligand (dpdo), has a significant effect on the type of MOF obtained. The effect of the metal salt anion is also examined. Crystal structures show that the materials we obtain are either polymeric or discrete molecules, which form a 2D or 3D network by means of supramolecular interactions.

Compounds synthesized were characterized by x-ray diffractometry and thermal analysis {thermogravimetry (TG), differential scanning calorimetry (DSC) and hot stage microscopy}. Microanalysis was used to confirm the elemental composition.

[1] Mitzi D.B., *J. Chem.Soc., Dalton Trans.*, 2001, 1-12. [2] De-Liang., Blake A.J., Champness N.R., Wilson C., Schröder M., *Chem. Eur.J.*, 2002, **8**, 2026-2033.

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