Connectivity Variation in Coordination Compounds of Isophthalate and Transition Metals

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The coordination of the isophthalate ligand (IPA^{2-}) with transition metal cations gives extended networks of variable architecture and dimensionality. The use of different auxiliary ligands and the variation of reaction conditions can provide control over the network dimensionality and/or the assembly of (3-n)-D networks.

Four coordination compounds, prepared by hydrothermal synthesis, are presented and compared to some related examples from the literature.

One structure of $Mn(IPA)(Py)_2$ is known from the literature [1]: it is made by chains assembled parallel to each other through weak nonbonded interactions. A polymorph of this structure has been prepared, in which there is less symmetry within the network and different packing of the chains.

Three examples of Co-IPA chain-structures are known from the literature [2]: in different reaction conditions one more structure of the same type has been prepared with increased metal-ligand connectivity giving a more robust 1-D network.

The structure of one Ni-IPA 1-D network is known from the literature [2]: two different coordination compounds with Ni²⁺ and IPA²⁻ have been prepared where the connectivity is progressively increased up to obtain a 2-D network.

Hydrothermal conditions were effectively used to investigate the structural variations in closely related coordination compounds structures. The detailed description of the structures, both from the point of view of the metal-ligand connectivity and of the non-bonded connectivity is meant to give some hint about the underlying structure-determining factors.

[1] Wang W., Ma., Zhang X., Chen C., LiuQ., Chen F., Liao D., Li L., *Bull. Chem. Soc. Jpn.*, 2002, **75**, 2609. [2] Bourne S.A., Mondal A., Zaworotko M.J., *Crystal Engineering*, 2001, **4**, 25.

Keywords: hydrothermal, connectivity, isophthalate