

## MS14-P41 | CRYSTAL STRUCTURES OF TRANSITION-METAL HALIDE COMPLEXES WITH CYANOPYRIDINE LIGANDS: SINGLE CHAINS, DOUBLE CHAINS, AND NETWORKS.

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We describe the structural variety of  $[M^{II}X_2(CNpy)_2]_n$  and  $[M^{II}X_2(CNpy)_1]_n$  with  $M^{II} = Mn, Fe, Co, Ni$ ;  $X = Cl, Br$  and  $CNpy = 3\text{-cyanopyridine}, 4\text{-cyanopyridine}$ . All crystal structures were determined by X-ray powder diffraction.

Single chains are the distinctive structural motif in  $[M^{II}X_2(CNpy)_2]_n$  compounds: the metal atoms are coordinated octahedrally to four halogen atoms and two cyanopyridine ligands. The halogen atoms bridge two metal atoms, resulting in  $[M^{II}X_2]_n$  single chains. The CNpy molecules coordinate at their pyridine nitrogen atoms ( $N_{py}$ ) and form lateral "wings" on the chains.

In  $[M^{II}X_2(CNpy)_1]_n$  compounds two different structure types are observed:

In case of  $X = Cl$ , 3-CNpy coordinates monodentately, which results in double chains of  $[M^{II}_2Cl_4]_n$ . 4-CNpy acts as a bidentate ligand connecting single chains *via* the two nitrogen atoms, forming two-dimensional networks.

In instance of  $X = Br$ , 4-CNpy and 3-CNpy both act as bidentate ligands to assemble networks.

By selecting the suitable combination of metal, halogen and ligand, single chains, double chains or networks easily become accessible.