

Poster Presentations

[MS38-P14] Tuning the role of nicotinamide in assemblies of Cd(II) complexes

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Apart from its biological importance, nicotinamide, having both pyridine and amide moieties, is a versatile reagent in crystal engineering of organic as well as of inorganic systems. The soft cadmium(II) ion preferentially bonds with the pyridine moiety of nicotinamide whereas bonding *via* the amide oxygen atom is considered rather unlikely. Furthermore, nicotinamide as a co-crystalizing component in inorganic systems is even more rarely observed [1]. Here we report several cadmium(II) structures assembled from differently constructed coordination building blocks (CBUs). The differences in coordination building blocks, *e.g.* monomeric, dimeric and polymeric units, are caused by presence of various counter ions, namely nitrate, acetate and perchlorate, respectively. In all cases nicotinamide (nia) is primarily a monodentate ligand being coordinated through the pyridine ring nitrogen atom. Additionally, by employing perchlorate anion it also exhibits its *N,O*-bridging mode (*N,O*-nia), thus forming polymeric CBUs with neighbouring Cd(II) ions being double bridged by two nicotinamide ligands in an antiparallel fashion. Crystal structures of both dimeric (acetate) and polymeric (perchlorate) CBUs are dominated by self-complementary amide hydrogen bonds. Employing nitrate anions, monomeric CBUs with coordinated NO₃⁻ anions are formed; these co-crystallize with additional nicotinamide molecule. In this case self-complementary amide bonds are not robust enough, but the CBUs are mutually linked *via* amide hydrogen bonds of catemeric C(4) type forming supramolecular wavy sheets. Interestingly, co-crystallized nicotinamide molecules themselves form chains

that stabilize the crystal structure by spanning two neighbouring crests of the wavy CBUs sheets.

[1] Allen, H.F. & Motherwell, W. D.S. (2002). *Acta Crystallogr.* **B58**, 380–388.

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