One-dimensional coordination polymers based on cobalt(II) and nickel(II))

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The synthesis of coordination compounds based on 3d cations has been of great interest not only for their various structures and topologies but also for their possible applications as functional materials in areas such as gas storage/adsorption, catalysis, magnetism, luminescence, among others. [1-3]

Two new coordination polymers based on Co^{II} and Ni^{II}, {[Co(HL)$(EtOH)_2$](ClO_4)}n (**1**), {[Ni(HL)$(EtOH)_2$](ClO_4)}$_n$ (**2**) (H2L = 2-{[(E)-1H-imidazol-4-ylmethylidene]amino}benzoic acid), were synthesized using a new Schiff base ligand. Compounds **1** and **2** are isostructural presenting a one-dimensional helical chain arrangement and crystallizing in a P21/n monoclinic space group. A hexacoordinated cation with an MN_2O_4 environment is present in the cationic fragment $[M(HL)(EtOH)_2]^+$ being the charge balanced by a ClO_4^- anion. Furthermore, the carboxylate group of HL- ligand is also acting as syn-anti bridge, producing the assembly of the $[M(HL)(EtOH)_2]^+$ fragments, thus generating a cationic chain growing through the b axis with an intercation M···M distance of 5.1257(13) Å and 5.164(4) Å for 1 and 2, respectively. The M-Ox distances are in the range of 2.060(3) Å to 2.136(4) Å for **1** and 1.988(3) to 2.107(4) Å for 2. Meanwhile, the M-Ny distances are 2.076(3) Å and 2.139(3) Å for 1 and 2.041(4) Å and 2.080(4) Å for **2**. The resulting MN_2O_4 moiety presents an elongated octahedral geometry with higher bond distances in the axial position corresponding to the EtOH molecules. Magnetic susceptibility characterization in the 1.8–300 K range reveals intrachain antiferromagnetic interactions for **1** and ferromagnetic interaction for **2** with the presence of the zero-field splitting phenomenon in both compounds.

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