Co(II) *n*-alkyl Phosphonates: Examples of Hybrid Organic-inorganic Compounds

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Organic-inorganic hybrids like metal alkyl phosphonates are very flexible systems because of the possibility of designing the organic moiety [1]. In this work we present our studies on the synthesis and single crystal structure determination of two new Co(II) *n*-alkyl phosphonates, i.e. Co(II) *methyl*-phosphonate, $Co[(CH_3PO_3)(H_2O)]$, and Co(II) *ethyl*-phosphonate, $Co[(C_2H_5PO_3)(H_2O)]$. Cobalt(II) *methyl*-phosphonate, crystallizes in the orthorhombic space group $Pna2_1$ with a=17.408(6)Å, b=4.790(3)Å, c=5.652(1)Å. Cobalt(II) *ethyl*-phosphonate crystallizes in the monoclinic space group *Pn*, with the following unit-cell parameters: a=4.806(2)Å, b=10.243(3)Å, c=5.674(1)Å and β=90.56(3)°. An hybrid layered structure made of alternation of inorganic and organic layers was found for both Co alkyl phosphonates. In both cases the inorganic layer is based on distorted $[CoO_6]$ chromophores with five oxygens from the $[PO_3]^{2-}$ group and one from the water molecule. The organic layer is composed by the alkyl groups of the adjacent ligands with van der Waals contacts between them.

[1] See for example *"Functional Hybrid Materials"* P. Gomez-Romero & C. Sanchez Eds., Wiley&VCH, 2004.

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