

Co(II) complexes with pseudohalide anions: crystal structures and magnetic properties.

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There is continuous and increasing research interest in the preparation of coordination compounds containing metal ions with an orbital contribution to the magnetic moment and thus to strong magnetic anisotropy, because of their potential use as magnetic materials. The first theoretical studies on the magnetic anisotropy of six-coordinated cobalt(II) complexes caused by axial distortion date to more than 40 years ago [1]. Among the ligands used, linear pseudohalides, such as cyanide, azide and thiocyanate, have long been studied.

The purpose of our work was to synthesize new mono-, binuclear or polymeric hexacoordinated Co(II) complexes with the CoN₆ chromophore containing linear (N₃, NCSe) and non-linear [N(CN)₂ (dicyanamide, dca), C(CN)₃ (tricyanomethanide, tcm), ONC(CN)₂ (nitrosodicyanomethanide, ndcm), NO₂NCN (nitrocyanamide, nca), NC(CN)₂₂ (1,1,3,3-tetracyano-2-azapropenide, tcap), NO₂C(CN)₂ (nitrodicyanomethanide, nodcm), C(CN)C(CN)₂₂ (1,1,2,3,3-pentacyanopropenide, pcp)] pseudohalide anions and to investigate their magnetic properties, depending on the crystal structures.

From the Co(II)–L–X systems, where L= 2,2'-bipyridine, 1,10-phenanthroline, 4-amino-3,5-bis(2-pyridyl)-1,2,4-triazole and X = NCSe, N₃, dca, tcm, ndcm, nca, tcap, nodcm, pcp, 17 compounds have been isolated and structurally characterized. Magnetic properties of these compounds were studied, too [2, 3].

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