Crystal structure, spectroscopic and magnetic properties of 2D network high-spin cobalt(II)complex with diethyl 2-pyridylmethylphosphonate.

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Streszczenie

The crystal and molecular structure of a cobalt(II) compound of the formula $[Co(2\text{-pmpe})_2(H_2O)_2](ClO_4)_2$, where 2-pmpe is diethyl 2-pyridylmethylphosphonate was determined by single crystal X-ray diffraction. The geometry of CoN_2O_4 chromophore shows an elongated tetrahedron, resulting from the didentate N,O-bonded two chelate ligands and two water molecules with pyridyl nitrogen atoms in an axial positions and oxygen atoms in the basal plane. Every mononuclear unit is linked to others ones via two extended Co–O–H···O–Cl–O···H–O–Co bridges, forming one-dimensional hydrogen bond system. Additional CH···π hydrogen bonds link the chains to form a two-dimensional (2D) polymeric network. Spectroscopic, EPR and magnetic measurements (1.8–300 K) results are presented in the light of the crystal structure. Magnetic measurements reflect the molecular character of the compound with very weak exchange interaction, transmitted through H-bonds where the moments are enhanced due to an important orbital contribution via spin–orbit coupling.

Słowa kluczowe

Cobalt(II), Hydrogen bonds, Crystal structure, Magnetic properties

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