Uniwersytet Wrocławski

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Co(II)-promoted transformation of diethyl(quinolin-2-ylmethyl)phosphonate to quinoline-2-carboxylate (2-qca):synthetic, structural and magnetic studies of $[Co(2\text{-}qca)_2(EtOH)_2]$.

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Streszczenie

The interaction of the diethyl(quinolin-2-ylmethyl)phosphonate (2-qmpe) ligand with $CoCl_2 \cdot 2H_2O$ unexpectedly leads to the formation of a compound with the formula $[Co(2\text{-}qca)_2(EtOH)_2]$ (2-qca = quinoline-2-carboxylate). This compound is a product of the oxidative cleavage of the C–P bond in 2-qmpe and the formation of the 2-qca ligand. The title compound was characterized by infrared, ligand field, EPR spectroscopy and low temperature magnetic (1.8–300 K) studies. Particularly, the crystal and molecular structures were determined by the X-ray diffraction. The CoN_2O_4 chromophore shows an elongated octahedron geometry, resulting from the two didentate N,O-bonded chelate ligands and two ethanol molecules – quinolil nitrogen atoms are located in axial positions and oxygen atoms are positioned in the basal plane. The crystal packing is due to hydrogen bonds and π–π stacking interactions, which give rise to a three-dimensional (3D) polymeric network. The magnetic properties reflect the molecular character of the compound, with a very weak magnetic exchange interaction. The moments are enhanced due to an important orbital contribution via spin–orbit coupling.

Słowa kluczowe

Cobalt(II), Quinolinecarboxylate, Oxidative degradation Crystal structure, Spectroscopy, Magnetism

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