

Preparation, characterization and X-ray analysis of $[\text{Co}_2(\text{Cl})_2\text{tpmc}](\text{BF}_4)_2$. Comparative structural analysis with the complexes having analogous geometries and ligands.

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Rok wydania

2007

Czasopismo

Journal of Molecular
Structure

Numer woluminu

827

Strony

80-87

DOI

10.1016/j.molstruc.2006.05.009

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

A novel binuclear Co(II) complex, $[\text{Co}_2(\text{Cl})_2\text{tpmc}](\text{BF}_4)_2$ (tpmc = *N,N',N'',N'''*-tetrakis(2-pyridylmethyl)-1,4,8,11-tetraazacyclotetradecane), was prepared and structurally characterized by X-ray diffraction analysis at low temperature. The complex crystallizes in $P2_1/c$ space group of the monoclinic crystal system, and its crystals are isomorphic with those of $[\text{Cu}_2(\text{Br})_2\text{tpmc}](\text{ClO}_4)_2$ complex. In the crystal structure the complex cations $[\text{Co}_2(\text{Cl})_2\text{tpmc}]^{2+}$ are settled around the inversion centres. Cobalt(II) is *exo* coordinated with four macrocyclic N atoms, and Cl^- supplements the fifth coordination site. Based on the index of trigonality, the coordination polyhedron formed around Co(II) ion is described as distorted trigonal bipyramid. Two metal centres are at a distance of 5.710 Å. This is the first Co(II) complex for which X-ray analysis confirmed a *chair* conformation of tpmc ligand. IR, EPR (X-band) and UV/VIS absorption and reflectance spectra, molar conductivities and magnetic measurements (SQUID) are used to study the investigated complex. A comparative structural analysis with some of the described Co(II) and Cu(II) complexes of analogous geometries and type of pendant azamacrocyclic ligands was also done.

Słowa kluczowe

Co(II) dimeric complex, Pendant azamacrocycles, Chloro ligand, X-ray analysis, Magnetic properties

Adres publiczny

<https://doi.org/10.1016/j.molstruc.2006.05.009>

Strona internetowa wydawcy

<http://www.elsevier.com>

