Intermolecular Interactions in the Crystal of a New Nickel(II)-cobalt(II)-nickel(II) Trinuclear Complex Containing a Macrocyclic Complex Ligand

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Z. Naturforsch. **59b,** 757 – 762 (2004); received February 9, 2004

A new trinuclear complex $[Co(NiL)_2(H_2O)_2](ClO_4)_2$ was synthesized by using a macrocyclic complex ligand [NiL], where L is the dianion of diethyl-5,6,7,8,16,17-hexahydro-6,7-dioxo-16*H*-dibenzo[*e*,*n*] [1,4,8,12]tetraazacyclopentadecine-13,19-dicarboxylate. X-ray analysis revealed that the two Ni(II) ions have the same distorted N_4 square planar coordination geometries. The Co(II) ion resides in a distorted octahedral O_6 coordination environment. In the crystal, $\pi\cdots\pi$ interaction between a phenyl ring and three non-aromatic π-systems involving Ni and N atoms was observed together with C–H$\cdots$O and O–H$\cdots$O hydrogen bonds. These non-covalent interactions link the di-cations and the perchlorate anions to form a 3D supramolecular network.

Key words: Nickel(II)-Cobalt(II)-Nickel(II) Complex, Crystal Structure, Non-Covalent Interaction, Macrocyclic Oxamido Ligand