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 \([\text{Co}(\text{NiL})_2(\text{H}_2\text{O})_2](\text{ClO}_4)_2\) 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[\text{e,n}] [1,4,8,12]tetraazacyclododecine-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 \(\pi\)-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 dications 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