Structural variations in Co(II), Co(III) and Zn(II) complexes of a chiral triphenolic macrocycle

Autorzy

Karol Wydra

Katarzyna Ślepokura

Janusz Gregoliński

Jerzy Lisowski

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Streszczenie

Five homonuclear cobalt(II) and zinc(II) complexes and two mixed-valence Co(II)/Co(III) coordination species derived from the enantiomers of the macrocycle $H_3\mathbf{L}$ were synthesized, characterized by spectroscopic methods and their X-ray crystal structures were determined. The large macrocyclic amine $\mathbf{L}^{3-}$ composed of three phenol moieties and three *trans*-1,2-diaminocyclohexane units can accommodate three Co(II), Co(III) or Zn(II) ions in three N_2O_2 compartments, forming $[M_3\mathbf{L}]^{n+}$ type complexes. The geometry of these complexes is different for the Zn(II) and Co(II) ions and depends on the counteranion used. Additionally, this macrocycle binds only two metal ions in its partly deprotonated $(H_2\mathbf{L})^-$ form to give complexes of the type $[M_2(H_2\mathbf{L})]^{n+}$. Amine $H_2\mathbf{L}^-$ also forms a tetranuclear $[M_4(H_2\mathbf{L})_2]^{n+}$ complex, where two macrocyclic units are additionally connected by bridging anions. XRD structures of seven additional coordination species that were isolated as single crystals are also presented.

Słowa kluczowe

Macrocyclic complexes, Polynuclear complexes, Co(II), Zn(II), Chiral ligands, Coordination chemistry, Magnetic properties

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