Manganese(II), Iron(II), Cobalt(II) and Nickel(II) Complexes of Methanesulfonic Acid Hydrazide. Crystal Structure of trans-Dichlorotetrakis(methanesulfonic Acid Hydrazide-N²)cobalt(II) and trans-Dichlorotetrakis(methanesulfonic Acid Hydrazide-N²)nickel(II)

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Methanesulfonic Acid Hydrazide, Metal Complexes, X-Ray Structure

The complexes [M(MSH)₄Cl₂] (MSH = CH₃SO₂NHNH₂; M = Mn (1), Fe (2), Co (3) and Ni (4)) were synthesized and characterized by elemental analysis, molar electric conductivity, IR and d-d electronic spectra. The X-ray single crystal analysis revealed for 3 (triclinic, P1, a = 8.077(2), b = 8.622(2), c = 8.742(2) Å, α = 71.98(3), β = 75.30(3), γ = 64.11(3), V = 515.8(2) Å³, Z = 1) and 4 (triclinic, P1, a = 8.050(2), b = 8.588(2), c = 8.686(2) Å, α = 73.35(3), β = 75.76(3), γ = 63.94(3), V = 511.8(2) Å³, Z = 1) that MSH is coordinated via the amino N atom, the donor atoms and the metal are coplanar, and the Cl ligands are in trans-configuration. On the basis of IR data a similar structure is suggested for 1 and 2. The electronic spectra of 3 and 4 are interpreted by the Angular Overlap Model and bonding parameters are derived: e₀(N) = 3384(15), e₀(Cl) = 2788(25), e₁(Cl) = 150(21) cm⁻¹ for 3, and e₀(N) = 3668(21), e₀(Cl) = 2602(150), e₁(Cl) = -21(128) cm⁻¹ for 4.