Crystal Structure and Magnetic Properties of a $Ce^{III} - Cu^{II}$ Heterodinuclear Complex

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Crystal structure and magnetic properties of a heterodinuclear complex, $LCu(Me_2CO)Ce(NO_3)O_3$ (L = (N,N'-propylene-bis(3-methoxysalicylideneimine)) are reported. $(C_{19}H_{22}N_2O_4)Cu(C_3H_6O)Ce(NO_3)_3$, monoclinic, space group $P2_1/c$, with a = 9.8295(4), b = 19.049(3), c = 15.668(3) Å, β = 94.873(12)°, V = 2923.2(7) Å^3, Z = 4. The central region of the complex is occupied by Cu^{II} and Ce^{III} ions which are bridged by two phenolato oxygen atoms of the ligand. The copper ion adopts a square-based 4+1 coordination made, the equatorial N_2O_2 donors being afforded by the ligand while the axial position is occupied by an oxygen atom of the acetone molecule. The Ce^{III} ion is deca-coordinated. In addition to the two phenolate oxygen atoms, the coordination sphere contains two oxygen atoms of the OMe side arms of L and six oxygen atoms from the three bidentate nitrate ions. The Ce···Cu separation is 3.601(2) Å and the dihedral angle between the CeO(2)Cu and CeO(3)Cu planes is 17.4(1)°. The magnetic susceptibility of the complex was measured over the range 5 – 350 K. The magnetic properties of the investigated compound are dominated by the crystal field effect on the Ce^{III} site, masking the magnetic interaction between the paramagnetic centers.

Key words: Copper, Cerium, Crystal Structure, Heterodinuclear Complex, Magnetic Properties