

Crystal Structure and Magnetic Properties of a Novel Cu^{II}Nd^{III} Heterodinuclear Schiff Base Complex

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The crystal structure of $L'Cu(Me_2CO)Nd(NO_3)_3$ ($L' = N,N'$ -bis(2-hydroxy-3-methoxybenzylidene)-ethylenediamine) was determined and the magnetic properties of the complex were investigated. $(C_{18}H_{18}N_2O_4)Cu(C_3H_6O)Nd(NO_3)_3$, monoclinic, space group $P2_1/c$, with $a = 9.8792(9)$, $b = 18.904(4)$, $c = 15.667(2)$ Å, $\beta = 95.360(10)^\circ$, $V = 2913.1(8)$ Å³, $Z = 4$. The central region of the complex is occupied by Cu^{II} and Nd^{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 basal N₂O₂ donors being afforded by the ligand while the axial position is occupied by the oxygen atom of the acetone molecule. The Nd^{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 Cu...Nd separation is 3.466(2) Å. The χT versus T plots, χ being the molar magnetic susceptibility per Cu^{II}Nd^{III} unit and T the temperature, has been measured in the 4.5 – 299.6 K temperature range. The magnetic properties of the investigated compound are dominated by the crystal field effect on the Nd^{III} site, masking the magnetic interaction between the paramagnetic centers.

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