s9'.m1.p7 **Synthesis, Crystal Structure and Magnetic Properties of a (μ-Hydroxo)(μ- Pyrazolato) Dicopper(II) Complex.** Y. Elerman[1], H. Kara[1], K. Prout[2], *[1]Department of Engineering Physics, Faculty of Sciences, University of Ankara, 06100 Besevler-Ankara, Turkey. [2]Chemical Crystallography Laboratory, University of Oxford, 9 Parks Road, OXFORD OX1 3PD, England*
Keywords: binuclear copper(II) complex, super-exchange interactions, antiferromagnetic coupling.

Preparation and magnetic properties of a 3,5-dimethylpyrazolate bridged binuclear copper(II) complex $[Cu_2(L)(3,5\text{-pyz})]$ (L=1,3-Bis(2-Hydroxy-1-napthylideneamino)propan-2-ol) is reported. The crystal structure of the complex was determined at 200K: $[C_{30}H_{26}N_4O_3Cu_2]$, monoclinic, space group $P2_1/n$, a=7.782(2), b=15.672(2), c=20.788(3) Å, β=96.144(2)°, V=2520.7(8)Å^3, Z=4. The coordination sphere is four-coordinated, planar with an N_2O_2 donor set. There are significant intermolecular interactions between neighbouring binuclear entities. The shortest intermolecular Cu … Cu^i distance is 3.399(1) A° and Cu-O^i distance is 2.722(1) A° (i= -x, -y, 1-z). In the structure, the dihedral angle between the two coordination planes is 165.04°. The variable-temperature magnetic susceptibility measurement for a powdered sample of the complex was carried out in the temperature range 5-350 K and analysed to obtain values of the parameter J in the exchange Hamiltonian $\boldsymbol{H}=-2J\mathbf{S}_{Cu}.\mathbf{S}_{Cu}$; J=-222 cm^{-1}. The magnetic moment at 300 K is about 2.75μ_B while 0.3μ_B at 5 K. The nature of the magnetic super-exchange interaction of the title compound is compared with similar dinuclear Cu(II) complexes[1,2,3]. The strong antiferromagnetism of the present complex is reasonably explained in terms of the orbital complementary effect based on Hoffmann's theory for superexchange interaction.

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s9'.m1.p8 **Synthesis, Crystal Structure and Magnetic Properties of a Novel [Gd^{III}-Cu^{II}) Heterodinuclear Complex.** H. Kara[1], Y. Elerman[1], K. Prout[2], *[1]Department of Engineering Physics, Faculty of Sciences, University of Ankara, 06100 Besevler-Ankara, Turkey. [2]Chemical Crystallography Laboratory, University of Oxford, 9 Parks Road, OXFORD OX1 3PD, England*
Keywords: heterodinuclear complex, super-exchange interactions, lanthanides.

Preparation and magnetic properties of heterodinuclear complex, namely $LCu(Me_2CO)Gd(NO_3)_3$ (L being (N,N'-bis(3-methoxysalicylidene)propane-1,2-diamine) and (Me_2CO standing for acetone) is reported. The crystal structure of the complex was determined at 200K: $[(C_{19}H_{22}N_2O_4)Cu(C_3H_6O)Gd(NO_3)_3]$ the compound crystallizes in the monoclinic space group $P\bar{1}$, with a= 9.795(9), b=18.763(13), c=15.579(13) A°, β=95.30(7)° and Z=4. The X-ray structure show that the Cu(II) ion adopts a square-based [4+1] coordination mode, the equatorial N_2O_2 donor are from L and the oxygen atom from the coordinated acetone molecule in the apical site. The Gd(III) ion is ten-coordinate. In addition to the two phenolate oxygen atoms, the coordination sphere contains two oxygen from the OMe side arms of L and six oxygen from the three bidentate nitroto ions. The magnetic susceptibility of the complex was measured over the range 5-350 K and the observed data were successfully simulated by the equation based on the spin-hamiltonian operator ($\mathbf{H}= -J\mathbf{S}_{Cu}.\mathbf{S}_{Gd}$), giving the exchange integral J(Cu-Gd)=5.6(1) cm^{-1}. This indicates a weak ferromagnetic spin exchange interaction between the Cu^{II} and Gd^{III} ions. The nature of the magnetic super-exchange interaction of the title compound is compared with similar [Gd^{III}-Cu^{II}] Heterodinuclear complexes[1,2,3].

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