MAGNETIC PROPERTIES OF CHELATES OF COPPER (II) WITH SULFUR-CONTAINING SCHIFF BASES

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It is known that copper (II) forms dimeric complexes with tetradentate azomethines of the N,N'ethylenebissalicylalimine type [1, 2], in which, however, an anomaly in the magnetic properties was not observed [3]. This fact was due to the large copper – copper distance (length of $\text{Cu} - \text{O}_{(\text{bridge})}$ bond = 2.41 Å) and the nonlinear arrangement of the two copper atoms and the bridge oxygen [4].

We studied the magnetic susceptibility of three chelates of copper (II) with tetradentate Schiff bases [5, 6].



In the range 300-80°K the effective magnetic moment (μ_{eff}) of (I) is constant and equal to 1.81 μ_B . The μ_{eff} values of the other two chelates decrease from 1.69 to 1.57 μ_B for (II), and from 1.75 to 1.69 μ_B for (III). Such a relation between μ_{eff} and the temperature is observed for the first time for planar chelates of copper (II) with tetradentate ligands of the Cu (2N 2S) type, and apparently is associated with the presence in compounds (II) and (III) of indirect exchange reaction between the copper atoms of the dimeric molecule, which becomes possible due to replacement of the bridge oxygen by the sulfur atom and some increase in the valence angle in the Cu - X - Cu chain.

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