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SYNTHESIS, STRUCTURE AND MAGNETIC PROPERTIES OF NEW BINUCLEAR COPPER(II) COMPLEXES WITH THIOSEMICARBAZONE LIGANDS

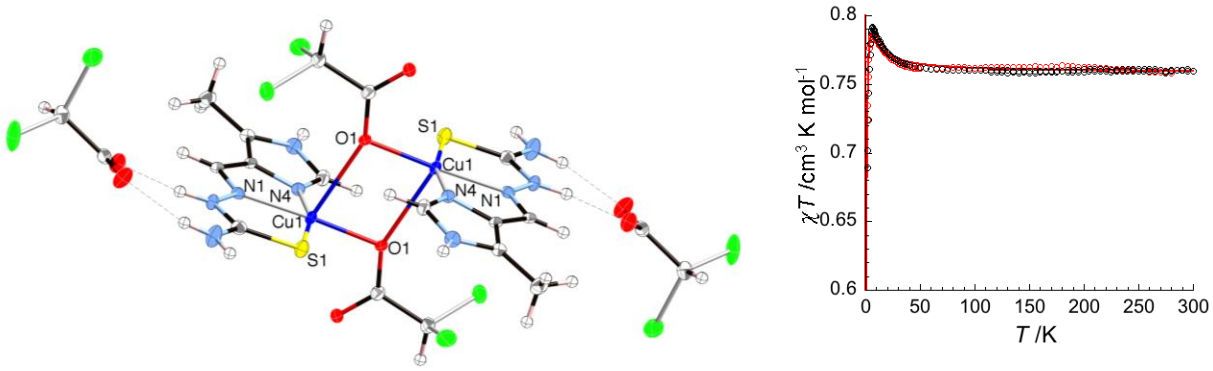
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In memoriam to Prof. Mihail Revenco

Thiosemicarbazones are now well established as an important class of sulfur donor ligands particularly for transition metal ions. The coordination compounds of copper(II) metal ions are most related as mono or dinuclear systems [1-2]. Copper(II) coordination compounds with thiosemicarbazone ligands continues to attract the attention of researchers due to their structural, biological, magnetic and catalytic properties.

The investigated tiosemicarbazone ligands were prepared by refluxing imidazole-carbaldehyde with tiosemicarbazide for 2-3 hours and reaction mixtures were kept overnight. The formed solid products were isolated by filtration, washed several times with cold alchohol and dried in air. The complexes with the formula [Cu(HL)X]X, X = $CHCl_2COO$- and HL - imidazol thiosemicarbazone derivatives were synthesised and structurally characterised (Figure 1a).



(a) **(b)**

Fig. 1. Cristal structure (a) and magnetic properties (b) of $[Cu(HL)CHCl_2COO]CHCl_2COO\}_2$

The crystal structure investigation show that the copper(II) complexes is formed. Copper(II) ions is coordinated via NNS donor atoms at the thiosemicarbazone fragment and O from carbaxylate ligand. The mononuclear unit is assembled in dimer via O from carboxylate ligand. The complexes have pyramidal geometry. To compensate the charge of compound one carboxylate ion is placed in the extern shape of the complex and forme two O···H bonds with NH grups from the coordinated thiosemicarbazone ligand.

The magnetic investigation show that at rom temperature the value of χT product is 0.75 cm^3K/mol according to two ions with spin 1/2. At low tempreture the χT product increase, confirming a feromagnetic coupling between two Cu(II) ions.

References:

1. Sain, S.; Saha, R.; Mostafa, G.; Fleck, M.; Bandyopadhyay, D. Polyhedron 2012, 31, 82.
2. Blomenkemper, M.; Schroder, H.; Pape, T.; Hahn, F. E. Inorg. Chim. Acta 2012, 390, 143.