

**s13.m38.p9** **Facile Oxidation of Metal Cations by Complexation with an Easy-to-prepare Ligand.** Gaël Labat, Gilles Gasser, Antonia Neels, Helen Stoeckli-Evans, *Institute of Chemistry, University of Neuchâtel, Switzerland. E-mail: gael.labat@unine.ch*

**Keywords :** N,O-ligand; Oxidation; Powder-diffraction

A new ligand, pyridine-2-carboxylic acid (3-hydroxy-pyridine-2-carbonyl)-amide, has been synthesized by a one-step reaction and in a quantitative manner. Complexations with different transition metal cations gave very interesting results [1]. For example, oxidations of the metal cations were observed with Fe(II) and Co(II) to give respectively, Fe(III) and Co(III) complexes. It was possible to form 2 polymorphs of the Fe(III) complex via 2 different synthetic methods.

Comparisons of our single crystal (fig.1) and powder X-Ray diffraction structure solutions with the structures of the complexes formed with the similar ligand, bis(2-pyridylcarbonyl)amine[2,3], will be discussed.

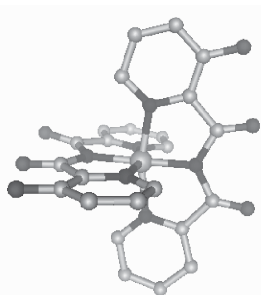


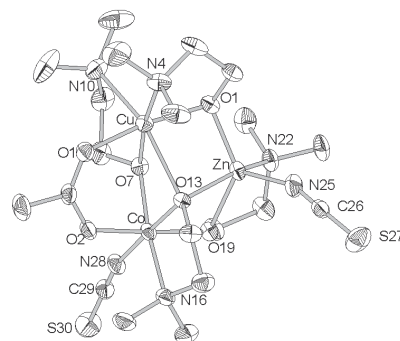
Fig. 1 : Structure of the Co(III) complex

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 [2] S. Wocadlo, W. Massa, J.-V. Folgado, *Inorg.Chim.Acta*, 1993, **207**, 199.  
 [3] A. Cantarero, J.M. Amigo, J. Faus, M. Julve, T. Debaerdemaeker, *J. Chem. Soc., Dalton Trans.*, **1988**, 2033.

**s13.m38.p10** **Novel Heterotrimetallic Cu<sup>II</sup>/Co<sup>III</sup>/Zn<sup>II</sup> Complex Obtained by Direct Synthesis.** Valeriya G. Makhankova<sup>a</sup>, Alexandr P. Datsenko<sup>a</sup>, Dmytro S. Nesterov<sup>a</sup>, Vladimir N. Kokozay<sup>a</sup> and Dieter Schollmeyer<sup>b</sup>, <sup>a</sup>Kiev National Taras Shevchenko University, Ukraine, and <sup>b</sup>Johannes Gutenberg University, Mainz, Germany. E-mail: leram@univ.kiev.ua

**Keywords:** Direct synthesis; Heterotrimetallic complex; Crystal structure

Heterotrimetallic complexes is a novel class of heteronuclear systems that may offer potential applications as new materials that exhibit exciting physical and magnetic properties. Despite the impressive progress in the preparation of mixed-metal complexes the field of heterotrimetallic compounds remains largely unexplored. The reaction of zerovalent copper, zinc oxide, cobalt(II) acetate and 2-(dimethylamino)ethanol (HMe<sub>2</sub>Ea) in the presence of ammonium thiocyanate in air yielded the novel heterotrimetallic compound [CuCoZn(Me<sub>2</sub>Ea)<sub>4</sub>(NCS)<sub>2</sub>(CH<sub>3</sub>COO)] that has been characterized by a range of spectroscopic methods and structurally. The complex features a trinuclear unit with an incomplete cube-like core CuZnCoO<sub>4</sub> (Fig).



The coordination environmental of the cobalt atom is completed by four O atoms (average 1.907 Å) and two N atoms (av. 1.947 Å) of three Me<sub>2</sub>Ea, NCS- and acetate groups in a distorted octahedral geometry. The copper atom adopts a distorted octahedral coordinational sphere with a {CuN<sub>2</sub>O<sub>4</sub>} chromophore. The four copper–O(N) bonds in the equatorial plane vary between 1.946(9) and 2.063(11) Å, the axial bonds are elongated (av. 2.409 Å). The zinc atom forms three quite short bonds with N and O atoms, O(1), O(19), N(25), and a longer bonding distance to O(13) and N(22), making a distorted trigonal bipyramidal geometry. The amino alkoxo- and acetate-bridges between metal centres result in the copper–cobalt, copper–zinc and cobalt–zinc separations of 3.054(9), 3.023(3) and 2.975(3) Å, respectively. The trinuclear units show no significant intermolecular contacts in the solid state. C<sub>20</sub>H<sub>43</sub>CoCuN<sub>6</sub>O<sub>6</sub>S<sub>2</sub>Zn, *M* = 715.56, monoclinic, *a* = 11.247(6) Å, *b* = 11.185(4) Å, *c* = 25.641(13) Å, β = 100.18(3)°, *U* = 3175(3) Å<sup>3</sup>, *T* = 173(2) K, *P* 2<sub>1</sub>/*n*, *Z* = 4, μ(Cu–K<sub>α</sub>) = 1.54178 mm<sup>-1</sup>, 6763 reflection measured, 6428 unique, 2689 observed (*I* > 2σ(*I*)), *R* = 0.0861. This work was supported in part by INTAS Grant 03-51-4532.