Coordination preferences of NNO and NNS Schiff base ligands with Co(III) complexes

Božidar Čobeljić[a], Milica Savić[b], Mima Jevtović[c], Dragana Mitić[c], Matija Zlatar[b], Maja Gruden[a], Katarina Anđelković[a]

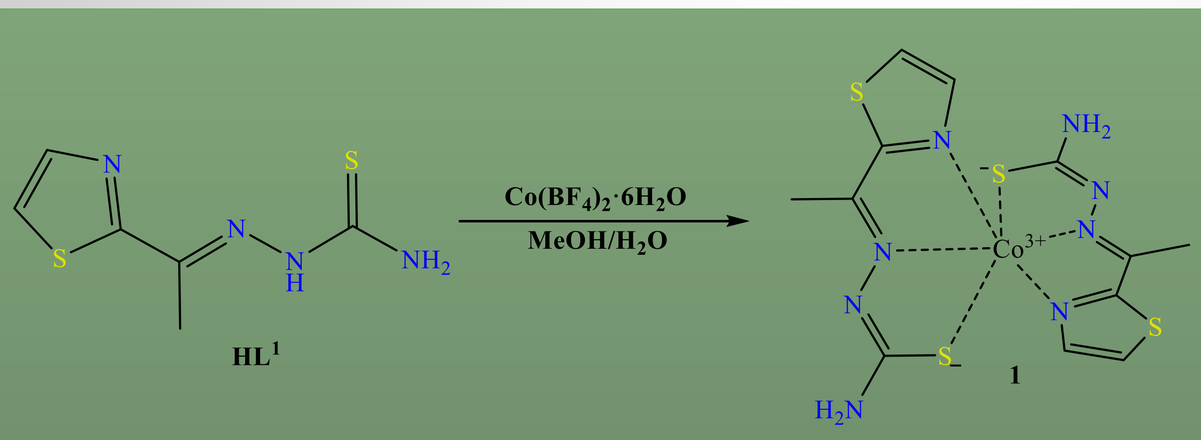
[a]*University of Belgrade-Faculty of Chemistry, , Studentski trg 12–16, 11000 Belgrade, Serbia*

[b]*University of Belgrade-ICTM, Department of Chemistry, Njegoševa 12, 11000 Belgrade, Serbia*

[c]*Innovative Centre of Faculty of Chemistry, Studentski Trg 12-16, 11000 Belgrade, Serbia*

e-mail: bozidar@chem.bg.ac.rs

Two Co(III) complexes $[Co(\mathbf{L}^1)_2]BF_4 \cdot H_2O$ (**1**), and $[Co(\mathbf{L}^2)(N_3)_3]$ (**2**) with condensation product of thiosemicarbazide and 2-acetylthiazole ($\mathbf{HL}^1$) and the condensation product of 2-acetylpyridine and Girard's P reagent ($\mathbf{HL}^2Cl$) and $Co(BF_4)_2 \cdot 6H_2O$ have been synthesized **Scheme 1** and **2**. Complexes were characterized by elemental analysis, IR and NMR spectroscopy and X-ray crystallographic analysis.



Scheme 1. Synthesis of complex $[Co(\mathbf{L}^1)_2]BF_4 \cdot H_2O$. (**1**)

Cobalt(III) complex (**1**) with $\mathbf{HL}^1$ ligand is bis octahedral complex in which two deprotonated ligand molecules coordinate in a *mer* arrangement through two NNS sets of donor atoms, while with $\mathbf{HL}^2Cl$, the ligand is coordinated to Co(III) ion in tridentate fashion through NNO set of donor atoms, and the other three coordination sites of a monokis octahedron are occupied by meridionally coordinated azide anions (**2**).

Scheme 2. Synthesis of complex $[Co(\mathbf{L}^2)(N_3)_3]$. (**2**)

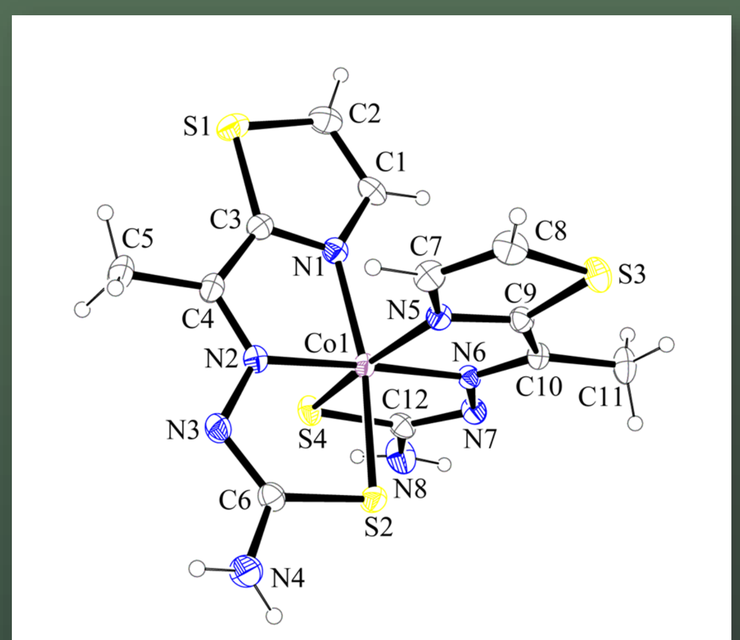


Fig 1. The ORTEP drawing of $[CoL^1_2]^+$ complex cation in **1**. Thermal ellipsoids are drawn at the 30% probability level. (**1**)

Fig 1. The complex **1** crystallizes in the orthorhombic space group *Pbca* .

The asymmetric unit of **1** consists of $[Co(\mathbf{L}^1)_2]^+$ complex cation, BF_4^- counter anion, and one solvent water molecule.

Fig 2. The complex **2** crystallizes in the triclinic space group $P-1$.

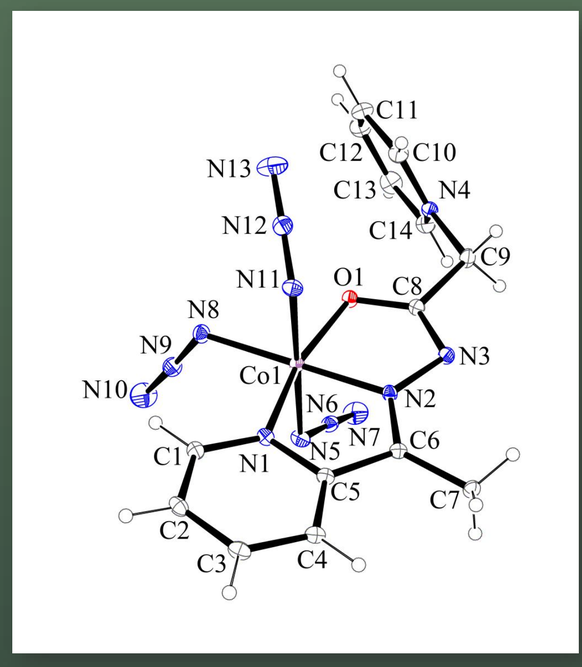


Fig 2. The ORTEP drawing of the $[Co(\mathbf{L}^2)(N_3)_3]$ **(2)** complex. Thermal ellipsoids are drawn at the 30% probability level. (**2**)

Acknowledgment: This research was supported by the Science Fund of the Republic of Serbia, #7750288, Tailoring Molecular Magnets and Catalysts Based on Transition Metal Complexes – ***TMMagCat***.