

## FA4-MS34-P01

**Crystallographic Study of N-O Schiff Bidentate Rhenium and Copper Complexes** Alice Brink,

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Schiff bases are a versatile class of organic compounds which readily form stable complexes with a variety of transition metals. The broad field of interest is due to their potential in bio-inorganic chemistry, catalysis, magnetochemistry and as liquid crystals [1, 2]. These Schiff-base ligands also provide the possibility as linkers to target-based directing groups, such as antibodies and proteins. Due to the potential application of  $^{186/188}\text{Re}$  radionuclides in radiotherapy [3, 4], there is considerable interest in the coordination chemistry of rhenium. The oxidation states of rhenium(I) and rhenium(V) are readily obtained and are stabilized by a variety of ligands [5]. Rhenium-Schiff base complexes attract interest due to the potential in radiotherapy and the ease by which the denticity, steric and electronic properties of the various ligand derivatives may be manipulated [6, 7]. Similarly, the use of  $^{64/67}\text{Cu}$  radionuclides in radiotherapy is also very attractive, particularly with the longer half-lives which are available [8], and since the redox and coordination chemistry of copper I and II oxidation states is well understood.

This study is concerned with the coordinative and structural properties of neutral and mono-anionic bidentate Schiff base ligands (N, O and P) with rhenium(I) tricarbonyl and copper(II) complexes. A crystallographic and synthetic study will be presented and discussed, highlighting several interesting substitution observations which have been made.

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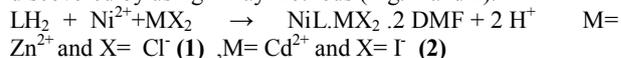
**Keywords: rhenium, copper, radiotherapy**

## FA4-MS34-P03

**Two Heteronuclear Coordination Compounds with Ni<sup>II</sup>M<sup>II</sup> Nuclear Structure.** Abdülkadir Akay<sup>a</sup>, Ümit Ergun<sup>a</sup>, Elif Gökçınar<sup>a</sup>, Ingrid Svoboda<sup>b</sup>, Orhan Atakol<sup>a</sup><sup>a</sup>*Ankara University, Faculty of Science, Dept. of Chem., Ankara, Turkey*, <sup>b</sup>*Materials Science, Technical University Darmstadt, Germany*E-mail: [atakol@science.ankara.edu.tr](mailto:atakol@science.ankara.edu.tr)

Bis-N,N'(salicylidene)-1,3-propanediamine is an ONNO type ligand of (LH<sub>2</sub>) which is known to give polynuclear complexes [1-3]. For about the last 10 years a technique is used that employs the imine groups of Schiff bases of this class, after being reduced by NaBH<sub>4</sub>, to obtain a ligand of phenol-amine type which tends to give polynuclear complex similar as Bis-N,N'(salicylidene)-1,3-propanediamine.

In this study, Bis-N,N'(2-hydroxybenzyl)-1,3-propanediamine was obtained by reducing Bis-N,N'(salicylidene)-1,3-propanediamine with NaBH<sub>4</sub> and by using this compound, complexes of Ni(II)-Cd(II)<sub>2</sub> and Ni(II)-ZnCl<sub>2</sub> nuclear structures were synthesized. These complexes were then characterised by Thermogravimetry, IR spectroscopy, elemental analysis and their molecular structures were discovered by using X-ray methods (Fig. 1 and 2).



In the complexes, Ni(II) ion is in octahedral conformation located between the iminic nitrogens and phenolic oxygens of the organic ligand and two DMF molecules. The phenolic oxygens also coordinate the Cd(II) ions, forming a  $\mu$  bridge. The octahedron has a distorted shape and the axial axis of it could not be clearly uncovered by the bond angles. Presumably, the oxygens of the DMF molecules are in axial position. On the other hand, Zn(II) and Cd(II) are located in an extremely distorted tetrahedral coordination sphere between the two phenolic oxygens and the two halogens. The tetrahedron shapes are almost the same because of the distance between the halogen ions. Given below is the crystallographic data of the complexes, structures of which were determined in this study.

For **1**, [C<sub>23</sub>H<sub>34</sub>Cl<sub>2</sub>N<sub>4</sub>NiO<sub>4</sub>Zn], P<sub>bca</sub>, a= 13.5709(8), b= 19.539(2) c= 20.887(2) Å,  $\alpha = \beta = \gamma = 90^\circ$ , Z= 8, D= 1.500 Mg/m<sup>3</sup>, (Data/parameters)= 5655/326, I>2 $\sigma$ , R, R<sub>w</sub>→0.0345, 0.0627, GOF=0.996,  $\Delta\rho_{\text{max}}$ ,  $\Delta\rho_{\text{min}}$ →0.303, -0.283 e.Å<sup>-3</sup>,  $\lambda = 0.71073$  Å.

For **2**, [C<sub>23</sub>H<sub>34</sub>Cd I<sub>2</sub>N<sub>4</sub>NiO<sub>4</sub>], P<sub>bca</sub>, a= 20.230(5), b= 14.607(1) c= 20.648(4) Å,  $\alpha = \beta = \gamma = 90^\circ$ , Z= 8, D= 1.863 Mg/m<sup>3</sup>, (Data/parameters)=6195/320, I>2 $\sigma$ , R, R<sub>w</sub>→0.0667, 0.2213 GOF=0.992,  $\Delta\rho_{\text{max}}$ ,  $\Delta\rho_{\text{min}}$ →2.147, -2.140 e.Å<sup>-3</sup>,  $\lambda = 0.71073$  Å.

The dihedral angles between the planes N1N1N2/N1C8C10N2 and C8C9C10/N1C8C10N2 show that in both complexes, the chelat rings formed between the iminic nitrogens and Ni(II) ions have a chair conformation close to ideal.

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**Keywords: heterodinuclear complexes, reduced Schiff base, ONNO type ligand**

## FA4-MS34-P04

**Synthesis, crystal structure and magnetic properties of a cyano-bridged two-dimensional assembly****[Fe(L)]<sub>2</sub>[Fe(CN)<sub>6</sub>].** Fatma Cagnur Alakus, Hulya Kara *Department of Physics, Balikesir University, Balikesir, Turkey*E-mail: [cagnuralakus@hotmail.com](mailto:cagnuralakus@hotmail.com)

A cyano-bridged Fe(III)-Fe(III) complex, [Fe(L)(MeOH)]<sub>2</sub>[Fe(CN)<sub>6</sub>](NEt<sub>4</sub>)(1) (L = N,N-bis(5-chlorosalicylidene)-1,2-diaminopropane) have been prepared and structurally and magnetically characterized. The compound 1 crystallizes in monoclinic space group P2(1)/n with a= 12.470, b= 15.441, c= 15.295 Å,  $\beta = 113.31^\circ$ . Single crystal X-ray analysis reveals that the complex assumes a cyano-bridged Fe<sub>2</sub>Fe unit. The two CN in the equatorial plane