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**Keywords:** silver perfluorocarboxylates; alcohol; single-crystal-to-single-crystal reaction

#### FA4-MS06-P10

### Synthesis and Structural Characterization of New Heteroleptic Aluminium Alkoxides and Siloxides.

Sergio Pedrosa<sup>a</sup>, Marta E.G. Mosquera<sup>a</sup>, Pilar Gómez-Sal<sup>a</sup>. <sup>a</sup>*Departamento de Química Inorgánica. Universidad de Alcalá, Campus Universitario, Alcalá de Henares, 28805-Madrid, Spain.*

E-mail: [sergio.pedrosa@uah.es](mailto:sergio.pedrosa@uah.es)

Aluminium attracts wide attention not only because of its rich chemistry, but also due to the important applications that exhibit in areas as diverse as organic synthesis, electronic materials, structural materials and catalysis.[1] In particular, aluminoxanes play a key role as co-catalysts in the Ziegler-Natta polymerization processes.[2] As well, aluminium alkoxide derivatives have proven to be very efficient catalysts in many polymerization reactions, such as ring opening polymerization.[3]

As a continuation of our work on functionalized aryloxide aluminium derivatives[4] we have extended our studies to silanols. The generation of molecular aluminosiloxanes compounds has an additional interest since this kind of species have shown to be useful both as model compounds for open-framework silicates and as precursors for the preparation of mixed metal oxide materials under mild conditions.[5]

We are particularly interested in achieving a good control of the structures obtained by controlling the reactions conditions. In this communication we present our latest results and our studies in relation to the different outcome depending on the aluminium precursor. Thus when  $\text{AlMe}_3$  is used the expected dimer  $[\text{AlMe}_2(\text{OR})_2]_2$  is formed, however if  $\text{AlClMe}_2$  is the precursor, unexpected results are attained such as the mixed alkoxide/syloxide derivative  $[\text{AlCl}(\text{OR})\text{OSi}(\text{OR})_3]_2$  shown in figure 1.

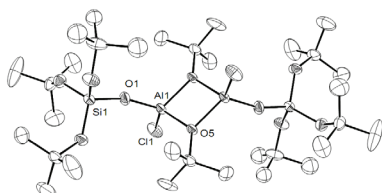


Figure1.

The new derivatives prepared were determined by X-ray diffraction methods, elemental analysis and NMR.

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**Keywords:** aluminum compounds; alkoxides; inorganic and organometallic compounds

#### FA4-MS06-P11

### Double Complex Salts with $[\text{Ru}(\text{NH}_3)_5\text{Cl}]^{2+}$ Cation and $[\text{OsCl}_6]^{2-}$ Anion: Synthesis and Properties.

Crystal Structure of the  $[\text{Ru}(\text{NH}_3)_5\text{Cl}]_2[\text{OsCl}_6]_2\text{Cl}_2$ .

Ilya Korolkov<sup>a</sup>, Svetlana Martynova<sup>a</sup>, Kirill Yusenko<sup>b</sup>, Sergey Korenev<sup>a</sup>. <sup>a</sup>*Nikolaev Institute of Inorganic Chemistry, Novosibirsk, Russia.* <sup>b</sup>*Inorganic Chemistry II - Organometallic and Materials, Ruhr-University Bochum, Germany.*

E-mail: [x-vizor@yandex.ru](mailto:x-vizor@yandex.ru)

Recently, interest in new energy sources and accumulators based on superfine metal catalysts deposited on the carbon supporter was grown [1, 2]. Ruthenium containing alloys show an extraordinary electrochemical activity and CO resistance [3]. This work continues a research of double complex salts, which are perfect precursors for obtaining solid solutions of platinum metals.  $[\text{Ru}(\text{NH}_3)_5\text{Cl}][\text{OsCl}_6]$  (**I**) was obtained by mixing of hot water solutions of  $[\text{Ru}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$  and  $\text{Na}_2[\text{OsCl}_6]$ . The residue was washed with water and acetone, then dried in air. Yield is 85 - 90%. A synthesis of  $[\text{Ru}(\text{NH}_3)_5\text{Cl}]_2[\text{OsCl}_6]_2\text{Cl}_2$  (**II**) was carried out with mixing of  $[\text{Ru}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$  powder,  $\text{Na}_2[\text{OsCl}_6]$  water solution and 0,1 M HCl. The mixture was left for 5 days in the dark place. The formed residue was washed with water and acetone, then dried in air. Yield is 85 - 90%. Cell parameters of **I** were refined by Rietveld method using  $[\text{Ru}(\text{NH}_3)_5\text{Cl}][\text{OsCl}_6]$  structure as a model [5]:  $a = 11,5931(4)$ ,  $b = 8,3181(3)$ ,  $c = 15,2344(4)$  Å;  $\beta = 90,707(4)^\circ$ ;  $V = 1469$  Å<sup>3</sup>; space group  $P2_1/m$ ;  $Z = 4$ . The crystal structure of **II** was determined with a X8APEX Bruker diffractometer (MoK $\alpha$ -radiation, graphite monochromator). Crystal structure data:  $C2/m$  space group,  $a = 11,1849(8)$  Å,  $b = 7,9528(6)$  Å,  $c = 13,4122(9)$  Å,  $V = 1175,75$  Å<sup>3</sup>,  $Z = 2$ . According to XRD data, **II** is isostructural to  $[\text{M}^I(\text{NH}_3)_5\text{Cl}]_2[\text{M}^{II}\text{Cl}_6]_2\text{Cl}_2$ , where  $\text{M}^I = \text{Rh, Ir, Co}$  and  $\text{M}^{II} = \text{Re, Os, Ir, Pt}$  [4]. Os-Cl bond lengths in the complex anion lay between 2,328-2,356 Å, Ru-N average bond length in complex cation is 2,111 Å, Ru-Cl is 2,334 Å. Distances between metals are typical for this kind of compounds. The smallest Ru...Os distance is 5,773 Å. Thermal stability of the complexes in different atmospheres was also investigated. It was found that the decomposition of **I** or **II** in hydrogen or helium atmosphere at 650° C gives a single-phase metal product with the hcp lattice. Cell parameters of obtained phases are close to cell parameters of original Ru-Os alloys obtained at 2000° C [6, 7].

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**Keywords:** platinum group; X-ray powder diffraction; crystal structure analysis

#### FA4-MS06-P12

**Heterobimetallic Malonate-Containing Molecular Compounds.** Laura Cañadillas-Delgado<sup>a</sup>, Fernando S. Delgado-Trujillo<sup>b</sup>, Óscar Fabelo<sup>a</sup>, Jorge Pasán<sup>a</sup>, Javier Campo-Ruiz<sup>c</sup>, Garry McIntyre<sup>d</sup>, Yolanda Rodríguez-Martín<sup>a</sup>, Catalina Ruiz-Pérez<sup>a</sup>. <sup>a</sup>Laboratorio de Rayos X y Materiales Moleculares, Dpto. de Física Fundamental II, Fac. Física, Avda. Astrofísico Fco. Sánchez, s/n. La Laguna, S/C de Tenerife. Spain. <sup>b</sup>BM16-LLS european Synchrotron Radiation Facility, 6 Rue Jules Horowitz-BP 220, 38043 Grenoble Cedex 9, France. <sup>c</sup>Instituto de Ciencia de Materiales de Aragón, CSIC-Universidad de Zaragoza, C/ Pedro Cerbuna 12, Zaragoza. Spain. <sup>d</sup>Institut Laue Langevin, 38100, Grenoble, France.  
E-mail: [ldelgado@ull.es](mailto:ldelgado@ull.es)

There has been an increasing interest in complexes containing paramagnetic metal ions exhibiting extended networks because of their potential applications in molecular magnetic materials [1]. In the context of our magneto-structural research with malonate-containing complexes with first-row metal transition centres, we have characterized the homometallic malonate-containing compounds of formula  $[M(H_2O)][M(mal)_2(H_2O)_2]$  [ $M = Co(II), Ni(II)$  and  $Zn(II)$ ]. They crystallize in a monoclinic structure with space group  $C2/m$ , the metal atoms lying on a 2/m site [2].

In these context we have synthesized three new heterobimetallic compounds of formula  $[M_xM'_{1-x}(H_2O)][M_xM'_{1-x}(mal)_2(H_2O)_2]$ , which are isostructural with the malonate-containing homometallic complexes, previously studied.

A quantitative analysis of a crystal of each sample through the X-ray microanalysis technique by using a copper pattern have been made, the analysis showing that M and M' ions are present in a 1:1 molar ratio. The single crystal X-ray studies don't allow us to distinguish each metal ion, due to the similar form factor, and therefore different crystal structures are possible; alternation of the homometallic layers or existence heterometallic planes within the crystal structure.

The aim of a proposed neutron diffraction experiment was, therefore, to determine the cationic distribution of the metal atoms in the crystal structure (Laue diffractometer VIVALDI).

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**Keywords:** neutron diffraction techniques; bimetallics; carboxylic acids

#### FA4-MS06-P13

**Syntheses and Crystal Structures of Two New Tricoordinate Cu(I) Complexes with Bidentate Schiff Base Ligands.** Hadi Kargar<sup>a</sup>, Reza Kia<sup>b</sup>, Hoong-Kun Fun<sup>b</sup>. <sup>a</sup>Department of Chemistry, School of Science, Payame Noor University (PNU), Ardakan, Yazd, Iran. <sup>b</sup>X-ray Crystallography Lab., School of Physics, Universiti Sains Malaysia, 11800, Penang, Malaysia.

E-mail: [hkargar@pnu.ac.ir](mailto:hkargar@pnu.ac.ir)

The coordination chemistry of copper(I) complexes has received increased attention over the last decades. This is mainly due to the potential application of these complexes in catalytic processes, photosensitization reactions, lightharvesting studies, and the design of supramolecular arrays [1,2]. The steric, electronic, and conformational effects imparted by the coordinated ligands play an important role in modifying the properties of the prepared metal complexes. In recent years, an increasing amount of research has been focused on the design and preparation of mono or dinuclear mixed ligand transition metal complexes with neutral, chelating nitrogen-containing ligands [3]. Here we report the crystal structures of two new tricoordinate Cu(I) complexes with two bidentate Schiff base ligands and copper(I) iodide. To the best of our knowledge, these complexes are the first tricoordinate complexes of copper(I) iodide with two bidentate unconjugated Schiff base ligands.

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**Keywords:** copper(I) complexes; schiff base; bidentate ligand

#### FA4-MS06-P14

**Magneto-resistance and Magnetocaloric Effect of the  $SmMn_{2-x}T_xGe_2$  (T:Fe and Co;  $x=0.05, 0.1$  and  $0.15$ ) Compound.** Yalcin Elerman<sup>a</sup>, Ilker Dincer<sup>a</sup>, Guliz Sevgül<sup>a</sup>. <sup>a</sup>Department of Engineering Physics, Ankara University, Ankara Turkey.

E-mail: [elerman@ankara.edu.tr](mailto:elerman@ankara.edu.tr)

During past three decades, extensive investigations have been performed on magnetism of the intermetallic compounds  $RMn_2X_2$  (R: rare earth, X: Si or Ge) which are characterized by a layered arrangement of R, Mn and X atoms. The magnetic properties of these compounds are governed by