

FA4-MS02-P04

Manganese(III)-Schiff-Base-Hexacyanoferrate Polymeric Compound. Synthesis, Structure, and Magnetic Properties. Elif Gungor^a, Hulya Kara^a, Raif Kurtaran^b, Akın Azizoglu^b, Yasemin Yahsi^{a,c}, Lorenzo Sorace^c. ^a*Department of Physics, Balıkesir University, Balıkesir, Turkey.* ^b*Department of Chemistry, Balıkesir University, Balıkesir, Turkey.* ^c*Dipartimento di Chimica and UdR INSTM, Università di Firenze, Firenze, Italy.*

E-mail: elifonly@gmail.com

A cyano-bridged Mn(III)–Fe(III) complex, $[\text{Mn}(\text{L})(\text{H}_2\text{O})_2\text{Fe}(\text{CN})_6](\text{NEt}_4)$ (**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 $P2(1)/c$ with $a = 12.396$, $b = 14.145$, $c = 14.872$ Å, $\beta = 99.37$ degree. Single crystal X-ray analysis reveals that the complex assumes a cyano-bridged Mn_2Fe unit. The two CN in equatorial plane of the $[\text{Fe}(\text{CN})_6]^{3-}$ moiety bridge two Mn ions, each trans position, which results in a 1D linear hydrogen bonded structure giving a $[\text{Mn}-\text{NC}-\text{Fe}-\text{CN}-\text{Mn}]$ linkage. The Fe ion assumes an octahedral geometry, in which the equatorial sites are occupied by N_2O_2 donor atoms of the Schiff base ligand, the two axial positions are filled by two cyanide ion of $[\text{Fe}(\text{CN})_6]^{3-}$. The magnetic measurement showed this complex exhibiting ferromagnetic behavior.

Keywords: cyanide complexes; molecular magnets; crystal engineering

FA4-MS02-P05

The Cyano-bridged Pentanuclear Mn(III)₄Fe(III) Cluster. Structure and Magnetic Properties. Ayse Karaoglu^a, Hulya Kara^a, Raif Kurtaran^b, Akın Azizoglu^b, Yasemin Yahsi^{a,c}, Lorenzo Sorace^c, Robert Hughes^d, Mairi F. Haddow^d. ^a*Department of Physics, Balıkesir University, Balıkesir, Turkey.* ^b*Department of Chemistry, Balıkesir University, Balıkesir, Turkey.* ^c*Dipartimento di Chimica and UdR INSTM, Università di Firenze, Firenze, Italy.* ^d*School of Chemistry, University of Bristol. Department of Chemistry, Bristol University, Bristol, UK.*

E-mail: ayse_karaoglu84@hotmail.com

A cyano-bridged Mn(III)–Fe(III) complex, $[\text{Mn}(\text{L})_2\text{Fe}(\text{CN})_6](\text{NEt}_4)(\text{MeOH})_2$ (**1**) (L = N,N'-bis(5-chlorosalicylidene)-2,2-dimethyl-1,3-diaminopropane) was prepared and characterized. The compound **1** crystallizes in Trigonal space group $P3(2)21$ with $a = 16.2948$, $b = 16.2948$, $c = 19.3671$ Å, $\gamma = 120.00^\circ$. Single crystal X-ray analysis reveals that the complex assumes a cyano-bridged Mn_4Fe unit. The four CN in the equatorial plane of the $[\text{Fe}(\text{CN})_6]^{3-}$ moiety bridge four Mn ions, each in the *trans* position, which results in a 3D neutral layered structure giving a $[-\text{Mn}-\text{NC}-\text{Fe}-\text{CN}-\text{Mn}-]$ linkage. The Mn ion assumes an elongated octahedral geometry, in which the equatorial

sites are occupied by N_2O_2 donor atoms of the Schiff base ligand, and the two axial positions are filled by two cyanide ion of $[\text{Fe}(\text{CN})_6]^{3-}$. The magnetic measurement showed this complex to exhibit ferromagnetic behaviour.

Keywords: cyanide complexes; molecular magnets; crystal engineering

FA4-MS02-P06

Cyanide-Bridged Mn(III)-Fe(III) Bimetallic Complex. Structure and Magnetic Characterization. Ahmet Karahan^a, Hulya Kara^b, Raif Kurtaran^a, Akın Azizoglu^a, Yasemin Yahsi^{b,c}, Lorenzo Sorace^c. ^a*Department of Chemistry, Balıkesir University, Balıkesir, Turkey.* ^b*Department of Physics, Balıkesir University, Balıkesir, Turkey.* ^c*Dipartimento di Chimica and UdR INSTM, Università di Firenze, Firenze, Italy.*

E-mail: ahmet_karahan10@hotmail.com

A cyano-bridged Mn(III)–Fe(III) complex, $[\text{Mn}(\text{L})(\text{MeOH})_2\text{Fe}(\text{CN})_6](\text{NEt}_4)$ (**1**) (L = N,N'-bis(3,5-chlorosalicylidene)-1,2-diaminopropane) have been prepared and structurally and magnetically characterized. The compound **1** crystallizes in monoclinic space group $P2(1)/n$ with $a = 12.350$, $b = 15.762$, $c = 15.614$ Å, $\beta = 110.39^\circ$. Single crystal X-ray analysis reveals that the complex assumes a cyano-bridged Mn_2Fe unit. The two CN in the equatorial plane of the $[\text{Fe}(\text{CN})_6]^{3-}$ moiety bridge two Mn ions, each in the *trans* position, which results in a 2D hydrogen bonded structure giving a $[\text{Mn}-\text{NC}-\text{Fe}-\text{CN}-\text{Mn}]$ linkage. The Fe ion assumes an octahedral geometry, in which the equatorial sites are occupied by N_2O_2 donor atoms of the Schiff base ligand, and the two axial positions are filled by two cyanide ion of $[\text{Fe}(\text{CN})_6]^{3-}$. The magnetic measurement showed this complex to exhibit ferromagnetic behavior.

Keywords: cyanide complexes; molecular magnets; crystal engineering

FA4-MS02-P07

Polyether Adducts of d-block Metal Compounds as Starting Materials for New Cluster Compound. Aurélien Crochet^a, Katharina M. Fromm^a. ^a*Department of Chemistry, University of Fribourg, Switzerland.*

E-mail: aurelien.crochet@unifr.ch

We are interested in molecular compounds, especially oxygen donor adducts of metal halides, because they are used as starting materials in the synthesis of low-dimensional polymeric compounds, i. e. clusters, and polymers or metal organic frameworks.^[1-4] Indeed, since more than two decades, metal aggregates are used in the low-cost synthesis of superconductors and other oxide materials by the sol-gel technique, or as volatile precursors in the MOCVD (Metal Organic Chemical Vapor Deposition) process if they present the required properties, namely solubility and volatility. One of the major problems

of the synthesis of organo-alkaline earth metals compounds is their tendency to form insoluble due on one hand to their low metal oxidation state (II) which only allows two anionic ligands, and on the other hand, their large ionic radii which demand a high coordination number. A parry to prevent a high degree of oligomerization is the use of neutral Lewis-coordinating ligands such as monodentate THF or multidentate polyether ligands which avoid any further "metal-metal contacts" via bridging ligands, saturating the metal cation. However, the chemistry of such metal halide or pseudo-halide adducts with neutral Lewis-coordinating ligands (usually non-polar aprotic solvents) is still not systematically studied. In this context, we have synthesized and characterized some new molecular compounds using polydentate neutral Lewis-coordinating ligands such as DME ($\text{CH}_3\text{OC}_2\text{H}_4\text{OCH}_3$), diglyme ($\text{CH}_3(\text{OC}_2\text{H}_4)_2\text{OCH}_3$) and triglyme ($\text{CH}_3(\text{OC}_2\text{H}_4)_3\text{OCH}_3$) in order to, in a fundamental way, know and understand better the chemistry of d-block metal halides in aprotic solvents. Secondly, we were interested in the study of the influence of the size of the ligand on the coordination sphere of the metal cation using monodentate (THF), bidentate (DME), tridentate (diglyme) and finally tetradentate (triglyme) O-donor ligands.

[1] W. Maudez, M. Meuwly, K. M. Fromm, *Chem. Eur. J.* **13**, 29, 8302-8316, **2007**. [2] K. M. Fromm, E. D. Gueneau, A. Y. Robin, W. Maudez, J. Sague, R. Bergougnant, *Z. Anorg. Allg. Chem.* **631**, 1725-1740, **2005**. [3] K. M. Fromm, *Dalton Trans.* **43**, 5103-5112, **2006**.

Keywords: polyether coordination chemistry; single-crystal structure determination; transition-metal compounds

FA4-MS02-P08

Design, Synthesis, Structural and Magnetic Properties of Pillared MN(II) Ethylmalonate Complexes. Mariadel Déniz^a, Jorge Pasán^a, Oscar Fabelo^a, Laura Cañadillas-Delgado^a, Ana Belén Lago^a, Catalina Ruiz-Pérez^a. ^a*Laboratorio de Rayos X y Materiales Moleculares, Departamento de Física Fundamental II, Facultad de Física, Universidad de La Laguna, Tenerife, Spain.*

E-mail: mdeniz@ull.es

Metal-organic frameworks (MOF) have been studied in recent years due to their potential applications in a wide variety of research fields, such as magnetism, molecule adsorption, catalysis, etc [1]. The rational design of these coordination polymers can provide of efficient synthesis. The flexibility of polycarboxylic acids is well known for the diversity of their connecting modes that lead from discrete entities to 3D networks [2]. Moreover, rigid rod-like spacer molecules like 4,4'-bipyridyl (4,4'-bpy) or 1,2-bis(4-pyridyl)ethylene (bpe) can be used for the construction of controlled structures [3], in particular, as pillars to connect 2D networks leading to 3D complexes [4].

We present the synthesis and structural properties of a novel 1D Mn(II)-based coordination framework as well as 3D complexes built up by the connection of Mn(II)-

ethylmalonate layers through rigid rod-like bridging molecules such as bpe or 4,4'-bpy (Fig. 1). The layer separation can be controlled by the length of the organic spacer.

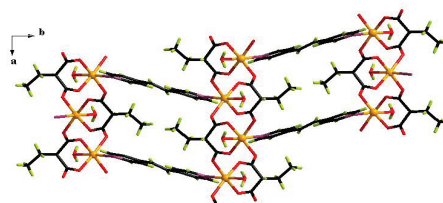


Figure 1.

[1] Janiak, *C. J. Chem. Soc., Dalton Trans.* **2003**, 2781. [2] S. L. Stupp et al, *Science*, **1997**, 277, 1242. F. Lloret et al, *Angew. Chem., Int. Ed.*, **1998**, 37, 135. [3] S. Noro et al, *J. Am. Chem. Soc.*, **2002**, 124, 2568.

FA4-MS02-P09

Crystal Structure of New 1D Polymer $\{[\text{Cd}(\text{NioxH}_2)(\text{SO}_4)(\text{Bpy})](\text{NioxH}_2)(\text{H}_2\text{O})_3\}_n$. Lilia Croitor^a, Eduard B. Coropceanu^b, Yurii M. Chumakov^a, Marina S. Fonari^a. ^a*Institute of Applied Physics, Academy of Sciences of R. Moldova, Academy str., 5, MD2028, Chisinau, Moldova.* ^b*Institute of Chemistry, Academy of Sciences of R. Moldova, Academy str., 3, MD2028, Chisinau, Moldova.*

E-mail: croitor_lilia@yahoo.com

The recent surge of research activity in the area of coordination polymers has been motivated by the ability of metal-ligand coordination in providing a facile approach to the controlled assembly of one-, two-, and three-dimensional extended solids. Incorporation of active groups into coordination polymers presents an excellent opportunity for the construction of functional materials with interesting properties [1]. We have favored the strategy of 'metal dioxime building block' for the construction of new generation of coordination polymers. Interaction in the system $\text{CdSO}_4 + \text{NioxH}_2 + \text{bpy}$ in the molar ratio 1:2:2 resulted in 1D polymer of the composition $\{[\text{Cd}(\text{NioxH}_2)(\text{SO}_4)(\text{bpy})](\text{NioxH}_2)(\text{H}_2\text{O})_3\}_n$, where 4,4'-bipyridine = bpy, 1,2-cyclohexanedionedioxime = NioxH₂. It crystallizes in the triclinic space group P-1 with $a = 10.144(2)$, $b = 11.814(2)$, $c = 12.423(3)\text{Å}$, $\alpha = 108.23(3)$, $\beta = 93.23(3)$, $\gamma = 90.65(3)^\circ$ and $Z = 2$. The X-ray diffraction shows that each Cd(II) ion binds one two-coordinate NioxH₂ molecule, two two-coordinate sulfato-anions as basal ligands and two bpy molecules as axial ligands with the formation of a square bipyramidal N₄O₂-coordination core. In common with the sulfate anions NioxH₂ formulate the robust extended binuclear metal platform. The key finding of this study is a definite availability of a metal dioxime building block for the construction of a new generation of coordination polymers.

This work was supported by the grant 09.819.05.04A (CSSDT).