University of Hyogo, Graduate School of Material Science, 3-2-1 Kouto, Kamigori-cho, Ako-gun, Hyogo, 678-1297, Japan, E-mail：mitsumi@sci.u-hyogo.ac.jp

Recently, multiferroic materials exhibiting ferromagnetic and ferroelectric properties have attract much attention because of the control of a magnetism by an electric field and/or the control of an electric polarization by a magnetic field.[1] We are studying the syntheses and the correlation between crystal structures and solid-state properties of a series of linear chain rhodium(I)-semiquinonato complexes from the viewpoint of the development of multifunctional materials based on the frontier orbital control.[2] Here we report the crystal structure, magnetic and dielectric properties of a linear chain rhodium(I)-semiquinonato complex, [Rh(3,6-DBSQ-4,5-$(MeO)_2$)$(CO)_2$] (**1**) (3,6-DBSQ-4,5-$(MeO)_2$ = 3,6-di-*tert*-butyl-4,5-dimethoxy-1,2-benzosemiquinonato). Complex molecules of **1** are stacked by the Rh-Rh interactions to form a linear chain structure. This compound undergoes first-order phase-transition in the temperature range of 208-224 K. Magnetic property changes from an antiferromagnetic interaction (room temperature (RT) phase) to a ferromagnetic one (low temperature (LT) phase, θ = +64 K). This compound undergoes a magnetic phase-transition to the metamagnet in which the interchain interaction is a ferromagnetic whereas the intrachain interaction is antiferromagnetic (T_N = 13.8 K). Furthermore, the real part, ε', of dielectric constant along 1-D chain in the RT phase shows the large value of 1000-2500 depending on the measuring frequency. ε' decreases rapidly with first-order phase-transition and takes a temperature-independent value of ca. 160 in the LT phase. *P-E* hysteresis measurement to reveal the ferroelectricity of this compound is now in progress.

References
1. Y. Tokura, *Science*, **2006**, *312*, 1481.
2. M. Mitsumi et al., *Angew. Chem. Int. Ed.*, **2005**, *44*, 4164.

Keywords: crystal structure and properties, ferromagnetism, dielectric properties

P07.02.55

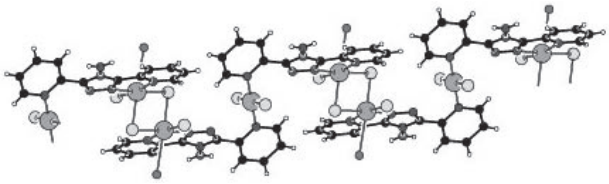
Acta Cryst. (2008). A**64**, C415

Magnetic and structural properties of some triazole metal complexes

Manuela R. Silva[1], Nuno D Martins[1], Joana A Silva[2], Ana A Beja[1], Jose A Paixão[1], Laura C Pereira[3], Abilio J Sobral[2]
[1]CEMDRX, Physics Department, Rua Larga, Coimbra, Coimbra, P-3004-516 Coimbra, Portugal, [2]Department of Chemistry, Univ. of Coimbra, P- 3004-535 Coimbra, Portugal, [3]ITN, Estrada Nacional 10, 2686-953 Sacavem, Portugal, E-mail：manuela@pollux.fis.uc.pt

1,2,4-triazole and triazole derivatives have shown to be good bridging ligands between 3d transition metals and the magnetic complexes thus achieved have shown several magnetic properties ranging from strong antiferromagnetic to ferromagnetic coupling [1]. Also, low spin to high spin transitions, induced by temperature changes, have been observed in polymeric Fe-triazole chains [2]. We have synthesised three new metal complexes mixing 4-amino-3,5-di-2-pyridil-4H-1,2,4-triazole with copper and manganese chloride, using different solvents. The ditriazole-dibenzoato-Cu(II) and the triazole-aqua-manganese complex, both triclinic, crystallize with the metal atoms in octahedral environments, four nitrogen atoms in the equatorial plane and two oxygen atoms in the axial positions. The copper chloride complex, monoclinic, shows the formation of chains running along the [101] direction. The chains consist of alternating dimers/monomers. The structural and magnetic results will be presented.

References
[1]. Beckmann, U., Brooker, S. Coord. Chem. Rev., 245, 17-29.
[2]. Kahn. O., Chem. Br. 2 (1999), p. 24.
Acknowledgements
This work was supported by F.C.T. under project POCI/FIS/57876/2004.



Keywords: metal complex, coordination, magnetic

P07.10.56

Acta Cryst. (2008). A**64**, C415

Construction molecular magnet with porosity, chirality from $[Fe(C_2O_4)Cl_2^-]_n$ with cation templet

Bin Zhang[1], Ming Zhe Wang[2], Yan Zhang[3], Ben Dao Zhu[1]
[1]Institute of Chemistry, The Chinese Academy of Science, Zhongguancun, Beijing, Beijing, 100080, China, [2]The College of Chemistry and Molecular engineering, Peking University, Beijing 100871, P. R. China, [3]The School of Physics, Peking University, Beijing 100871, P. R. China, E-mail：zhangbin@iccas.ac.cn

One-dimensional antiferromagnetic $[Fe(C_2O_4)Cl_2^-]_n$ which merged from $[CrMn(C_2O_4)_3^-]_n$ and $FeCl_4^-$ is a good anion for conductive molecular magnet as weak-ferromagnetic conductor and weak-ferromagnetic insulator [1-5]. Three kinds configurations of $[Fe(C_2O_4)Cl_2^-]_n$ chain in the molecular crystal have been found depending on cation templet: the first one is zigzag chain, the second one is boat-shape chain, the third one is a chiral chain which produce chiral magnet from achiral ligands. A molecular magnets of $[Fe(C_2O_4)Cl_2^-]_n$ with porosity was got. Their crystal structures and physical properties were studied.

[1] E. Coronado, J. R. Galan-Mascatos, C. J. Gomez-Garcia, V. Laukhin, Nature, 2000, 408, 447.
[2] S. Uji, H. Shinagawa, T. Trashima, T. Yakabe, Y. Terai, M. Otkumoto, A. Kobayashi, H. Tanaka, H. Kobayashi, Nature, 2001, 410, 908.
[3] B. Zhang, Z. M. Wang, D. B. Zhu, H. Kobayashi, MS73, IUCrXX, Florence, 23-31 August, 2005.
[4] B. Zhang, Z. M. Wang, H. Fujiwara, H. Kobayashi, M. Kurmoo, K. Inoue, T. Mori, S. Gao, Y. Zhang, D. B. Zhu, Advanced Materials, 2005, 17, 1988.
[5] B. Zhang, Z. M. Wang, Y. Zhang, K. Takahashi, Y. Okano, H. Cui, H. Kobayashi, K. Inoue, M. Kurmoo, F. L. Pratt, D. B. Zhu, Inorganic Chemistry, 2006, 45, 3275.
This work was supported by NSFC.20473095, 20673120, MOST. 2006CB601001, 2006CB932102, P. R. China.

Keywords: dual-function molecular crystal, molecular magnet, chiral magnet