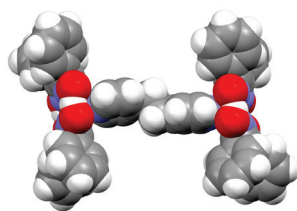


Keywords: Ligand design, Coordination complexes, Crystal characterization

FA4-MS34-P14

Two Wheel-and-Axle Binuclear Copper(II) Dioximates Mediated by Bpetha Ligand. Eduard B. Coropceanu,^a Lilia Croitor,^b Mark M. Botoshansky^c and Marina S. Fonari^b. ^a*Institute of Chemistry, Academy of Sciences of R. Moldova, Academy str., 3, MD2028, Chisinau, Moldova,* ^b*Institute of Applied Physics, Academy of Sciences of R. Moldova, Academy str., 5, MD2028, Chisinau, Moldova;* ^c*Schulich Faculty of Chemistry, Technion-Israel Institute of Technology, Technion City, 32000 Haifa, Israel*
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Porous transition metal-based structures primarily relied on coordinative interactions are of current interest owing to the need to development new materials for technologies and economies. Molecules with a shape not suitable for close packing tend to form crystals with other available molecules. Therefore, the creation of potentially porous frameworks is possible through the design of host molecular geometries that prevent close packing. Our continuous efforts [1,2] have been applied for using the strategy of 'metal oximate' building blocks in conjunction with neutral bridging ligands for design and synthesis of binuclear wheel-and-axle complexes in a controlled fashion. The d^9 coordination of the Cu(II) cation favors the robust square-pyramidal (5-coordinate) geometry. 1,2-Bis(4-pyridyl)ethane (bpetha) acquires variable flexibility and functionality which can direct specific framework properties (dimensionality, void space, and topology). The interaction of copper(II) acetate with classic dioximes in the presence of bpetha resulted in two novel binuclear complexes of the compositions $[\text{Cu}_2(\text{dmgH})_4\text{bpetha}]$ (**1**), and $[\text{Cu}_2(\text{dphH})_4\text{bpetha}]$ (**2**) (Figure), where $\text{dmgH}_2 = \text{dimethylglyoxime}$, $\text{dphH}_2 = \text{diphenylglyoxime}$. The main structural feature of both compounds is an availability of a



binuclear unit $[\text{Cu}_2(\text{diox})_4(\text{bpetha})]$ (diox = dmgH or dphH residue) where each Cu(II) atom has an identical N_5 -environment formulated by four oximic nitrogen atoms of two monodeprotonated ligands in a slightly

distorted square planar mode and the nitrogen atom of the bridging bpetha molecule in the apical position. The Cu...Cu separation equals to 13.68 Å in **1** and 13.42 Å in **2**, respectively. The bulky phenyl substituents preclude the effective crystal packing in **2**, the volume of the solvent-accessible voids revealed value of 10.3%. For comparison, in $[\text{Cu}_2(\text{dphH})_4\text{bpy}]$ (where $\text{bpy} = 4,4'$ -bipyridine) [2] the solvent area occupied by the disordered DMF molecules revealed value of 23.1%. The key finding of this study is a definite availability of a robust copper dioximate building block for the rational crystal design.

[1] Coropceanu E., Croitor L., Gdaniec M., Wicher B., Fonari M., *Inorganica Chimica Acta*, 2009, Vol.362, p.2151-2158; [2] Coropceanu E.B., Croitor L.M., Chumakov Yu.M., Fonari M.S., *Crystallography Reports*, 2009, Vol. 54, No. 5, pp. 837-840.

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Keywords: copper compounds, coordination compounds, crystal structure analysis

FA4-MS34-P15

One Dimensional Coordination Polymer of Nickel(II)-Squarate with N,N,N',N'-tetramethylethylenediamine, $\{[\text{Ni}(\mu\text{-sq})(\text{H}_2\text{O})_2(\text{tmen})]\cdot\text{H}_2\text{O}\}_n$. Necmi Dege^a, Hakan Erer^b, Okan Zafer Yeşilel^b, Yelda Bingöl Alpaslan^a, ^a*Faculty of Arts and Sciences, Department of Physics, Ondokuz Mayıs University, Samsun, Turkey,* ^b*Faculty of Arts and Sciences, Department of Chemistry, Osmangazi University Eskişehir, Turkey*
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A novel 1D coordination polymer $\{[\text{Ni}(\mu\text{-sq})(\text{H}_2\text{O})_2(\text{tmen})]\cdot\text{H}_2\text{O}\}_n$ ($\text{H}_2\text{sq} = \text{squaric acid}$ and $\text{tmen} = \text{N,N,N',N'-tetramethylethylenediamine}$) has been synthesized and structurally characterized by X-ray crystallography. The spectral (IR and UV-vis.) and magnetic susceptibility are reported. The structure of the complex consists of the bidentate tmen ligand bound to Ni(II) center and a bridging squarate in the 1,3-bonding mode. The distorted octahedral geometry of Ni(II) is completed by two aqua ligands. The structure contains chains of squarato- O^1, O^3 -bridged polynuclear nickel(II) units held together by intermolecular hydrogen bonds interactions between water molecules and oxygen atoms of squarate ligand forming a novel R6 motif. The crystal structure of the complex is presented in Fig. 1. The complex crystallizes in the monoclinic system and space group $\text{P2}_1/\text{c}$. The nickel atom has a distorted octahedral geometry with one tmen nitrogen [$\text{Ni1}-\text{N2} = 2.140(2) \text{ \AA}$], one aqua ligand [$\text{Ni1}-\text{O5} = 2.085(2) \text{ \AA}$] and two squarate oxygen [$\text{Ni1}-\text{O1} = 2.068(1)$ and $\text{Ni1}-\text{O2} = 2.080(1) \text{ \AA}$] atoms in the equatorial positions and one tmen nitrogen [$\text{Ni1}-\text{N1} = 2.136(2) \text{ \AA}$] and one aqua ligand [$\text{Ni1}-\text{O6} = 2.095(2) \text{ \AA}$] in the apical position. The Ni-Ntmen bond lengths are comparable with those similar nickel complex, [1].

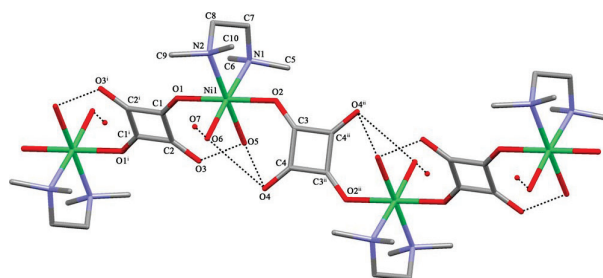


Fig. 1 The molecular structure of **1** showing the atom numbering scheme

[1] O.Z. Yeşilel, H. Erer, N. Dege, O. Büyükgüngör, Z. Anorg. Allg. Chem., 2009, 635, 577.

Keywords: squarate complex, N,N,N',N'-tetramethylethylenediamine complex, coordination polymer