Only a few silver(I) monocarboxylates have been characterized, of which the acetate Ag(OAc) [1] and the trifluoroacetate Ag(OTfa) are important examples [2]. Outstanding structural features are carboxylate bridged silver(I) dimers which are further bridged to chains. We have obtained several new Ag(I) carboxylates of which silver(I) isobutyrate, Ag(i-OBu), is especially interesting because the $[Ag(i\text{-}OBu)]_2$ dimers are connected to layers.
For the synthesis of Ag(i-OBu) 0.5 mmol silver carbonate are dissolved in in 25 ml isobutyric acid. After five weeks of isothermic evaporation cuboid shaped single crystals had formed. Ag(i-OBu) crystallizes in the monoclinic space group $P2_1/c$ (no. 14) with a = 1333.7(3), b = 835.9(1), c = 1005.5(2) pm, β = 98.74(2)°, Z = 4.

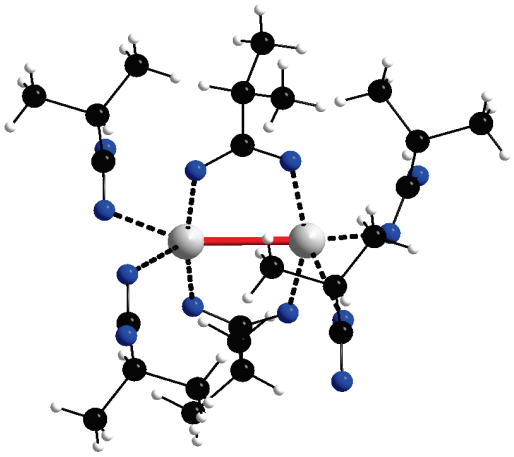

Fig 1. $[Ag(i\text{-}OBu)]_2$ dimers with two isobutyrate anions completing the coordination sphere of each Ag(I) ion as part of the crystal structure of silver(I) isobutyrate

Within the $[Ag(i\text{-}OBu)]_2$ dimers, the Ag—Ag distance is 281.4(4) pm, only slightly larger than in $[AgOAc]_2$ (279.4(4) pm) [1] and considerably shorter than in $[Ag(OTfa)]_2$ (296.7(3) pm) [2]. In Ag(i-OBu), the coordination sphere of Ag(I) is completed by two additional oxygen atoms of isobutyrate anions belonging to neighbouring dimers such that the isobutyrate ligands have two different bridging functions. Of course, the Ag—O distances are shorter within the dimers, as short as 219 pm, and much longer between the dimers, 243-259 pm. The shortest Ag—Ag distance between dimers is 331.3(5) pm, maybe not within the range of argentophilic attractions but still rather short. These short Ag—Ag distances and the 2+2 coodination by oxygen atoms lead to a two-dimensional arrangement, such that the present Ag(i-OBu) must be considered as the first Ag(I) mono carboxylate with a layered structure.

[1] Olson, L.P., Whitcomb, D.R., Rajeswaran, M, Blanton, T.N., Stwertka, B.J., Chem. Mater., 2006, 18, 1667-1674. [2] Griffin, R.G., Ellett, J.D., Mehring, M, Bullitt, G., Waugh, J.S., J. Chem. Phys., 1972, 57, 2147-2155.

Keywords: Silver dimers, Isobutyrate, Crystal structure

FA4-MS34-P10

Characterization and Antimicrobial Activities of Cobalt-Pyrazine-2,3-dicarboxylate Complexes.

Orhan Büyükgüngör[a] , Okan Zafer Yeşilel[b], Aylin Mutlu[b] and Cihan Darcan[c], [a]*Department of Physics, Ondokuz Mayıs University, Samsun, Turkey,* [b]*Department of Chemistry, Eskişehir Osmangazi University, Eskişehir, Turkey,* [c]*Department of Biology, Dumlupınar University, Kütahya, Turkey*
E-mail: orhanb@omu.edu.tr

Novel cobalt-pyrazine-2,3-dicarboxylate complexes with 1,10-phenanthroline (phen), [Co(pzdca)(phen)2]2H2O (1), N,N,N′,N′-tetramethylethylenediamine (tmen), (H2tmen)-[Co(pzdca)2(tmen)]·9H2O (2) and 2,2-dimethyl-propane-1,3-diamine (dmpen), [Co(CO3)(dmpen)2](pzdca)0.5·H2O (3) have been synthesized and characterized by elemental and thermal analyses, spectroscopic (IR and UV-Vis.) and X–ray diffraction techniques. In 1 and 2, pyrazine-2,3-dicarboxylate ligand coordinated to the Co(II) ions through one nitrogen atoms of pyrazine ring and oxygen atoms of carboxylate group as a bidentate ligand and distorted octahedral geometries of 1 and 2 are completed by phen and tmen ligands, respectively. In 2, the tmen molecules exhibit chemically different functions; it coordinated to the Co(II) ion as a bidentate ligand and in the other form it protonated and acts as counter ion. In complex 3, Co(III) ion is coordinated by four nitrogen atoms of dmpen and two oxygen atoms of CO3 ligand and the pzdca behaves as a counter ion. Furthermore, structures of 1 and 2 contain extensive hydrogen bonding between crystal water molecules to form infinite 2D water layers and 1D water chains, respectively. In vitro antimicrobial activities of new complexes were tested against selected wild type and clinical microorganisms by MIC. Complexes exhibited antimicrobial activity at high concentrations against the bacteria, fungi and clinical isolate tested.

Keywords: Pyrazine complexes, Cobalt complexes, Antimicrobial activities

FA4-MS34-P11

Crystallogpraphic study of the system $Ni(NO_3)_2$ – *cyclam* - $[Ni(CN)_4]^{2-}$.

Juraj Černák[a], Monika Stolárová[a], Milagros Tomás[b], Larry R. Falvello[b], [a]*Institute of Chemistry, Department of Inorganic Chemistry, P. J. Šafárik University in Košice, Slovakia,* [b]*University of Zaragoza-C.S.I.C.,Department of Inorganic Chemistry and I.C.M.A., Zaragoza, Spain*
E-mail: juraj.cernak@upjs.sk

Within our broader study on Ni(II) (S = 1) complexes as low-dimensional magnetics [1] we have studied the system $Ni(NO_3)_2$ – *cyclam* - $[Ni(CN)_4]^{2-}$ (*cyclam* = 1,4,8,11-tetra-azacyclotetradecane). The ligand *cyclam* was chosen as it usually blocks four equatorial coordination sites around the central atom and thus promotes, in the presence of suitable bridging units (in our case the $[Ni(CN)_4]^{2-}$ anion) the formation of one-dimensional structures. By direct reaction the complex Ni(*cyclam*)Ni(CN)$_4$ (**1**) was prepared in the form of microcrystalline powder. On the other hand, the use of diffusion techniques led to a mixture of single crystals: yellow [Ni(*cyclam*)$(NO_3)_2$] (**2**) which has already been described [2], and two novel complexes, pale violet Ni(*cyclam*)Ni$(CN)_4\cdot 2H_2O$ (**3**) and yellow [Ni(*cyclam*)(CN)] $NO_3\cdot H_2O$ (**4**). Both **3** and **4** exhibit the expected one-dimensional structures. In the structure of **3** there are present two crystallographically independent chains [-Ni(*cyclam*)-NC-