

To date, more than 70 acetate uranyl complexes have been researched, while uranyl complexes with anions of other monocarboxylic acids are considerably less studied. Thus, structure of only one uranyl complex with *i*-butyrate ligands is determined [1], and there exists no data about U(VI) compounds containing *n*-butyrate and *n*-valerate ions. In present research we defined crystal structures of $\text{NaUO}_2(\text{n-C}_3\text{H}_7\text{COO})_3 \cdot 0.25\text{H}_2\text{O}$ (I), $\text{KUO}_2(\text{n-C}_3\text{H}_7\text{COO})_3$ (II) and $\text{UO}_2(\text{n-C}_4\text{H}_9\text{COO})_2 \cdot 2\text{H}_2\text{O}$ (III).

I and II were derived as prismatic yellow crystals while studying the interaction between uranyl nitrate and butyric acid in presence of sodium hydroxide (or potassium hydroxide). Prismatic yellow crystals III were derived as a result of interaction between uranium trioxide and aqueous solution of valeric acid. Fundamental absorption bands of UO_2^{2+} , $\text{C}_3\text{H}_7\text{COO}^-$ or $\text{C}_4\text{H}_9\text{COO}^-$ (only for III) ions and water molecules (for I and III) are present in IR spectra of I-III.

Structures of I-III were determined using X-ray diffraction. I crystallizes in the monoclinic system with the unit cell parameters $a = 13.567$, $b = 20.07$, $c = 13.614$ Å, $\beta = 106.839^\circ$, space group $P2_1$, $Z = 8$ and $R = 0.049$. II crystallizes in the orthorhombic system with the unit cell parameters $a = 17.133$, $b = 19.697$, $c = 21.969$ Å, space group $P2_12_12_1$, $Z = 16$ and $R = 0.056$. III crystallizes in the monoclinic system with the unit cell parameters $a = 7.782$, $b = 10.802$, $c = 9.512$ Å, $\beta = 104.885^\circ$, space group $C2/m$, $Z = 2$ and $R = 0.025$. Some butyrate and valerate ions in I-III are disordered over two positions.

Coordination polyhedron of every uranium atom in I-III is hexagonal bipyramid UO_8 with oxygen atoms of uranyl ion located on the main axis. In I and II there are four crystallographic sorts of atoms U and R ($R = \text{Na}$ or K with coordination numbers 6 or 5 (5 – only for Na(3), which is bonded with water molecule in I)). The structural units of I and II are mononuclear groups of the composition $[\text{UO}_2(\text{C}_3\text{H}_7\text{COO})_3]^-$ with crystal chemical formula AB^{01}_3 ($A = \text{UO}_2^{2+}$, $B^{01} = \text{C}_3\text{H}_7\text{COO}^-$) (coordination types of ligands are assigned according to [2]). Tris(butyrate)dioxidouranium(VI) complexes are joined through electrostatic interactions with sodium and potassium cations, and, in I, also through a system of hydrogen bonds with participation of water molecules. The structural units of III are uncharged complexes $[\text{UO}_2(\text{C}_4\text{H}_9\text{COO})_2(\text{H}_2\text{O})_2]$ with crystal chemical formula $AB^{01}_2M^1_2$ ($A = \text{UO}_2^{2+}$, $B^{01} = \text{C}_4\text{H}_9\text{COO}^-$, $M^1 = \text{H}_2\text{O}$), which are joined through a system of hydrogen bonds.

Using TOPOS program package [3], crystal chemical analysis of sodium and potassium uranyl complexes with acetate and butyrate ligands was carried out.

This work was supported by Ministry of Education and Science of the Russian Federation (project no 02.740.11.0275).

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Keywords: uranyl, butyrate, valerate

MS61.P08

Acta Cryst. (2011) **A67**, C606

Crystal structure of complexes of uranyl chromate with isomers of pyridinecarboxylic acid

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The structures of uranyl sulfate with some isomers of pyridinecarboxylic acid are described in [1, 2]. To investigate the influence of nature of oxoanions on the structure of the complexes, complexation of uranyl chromate with nicotinic and isonicotinic acid in aqueous solutions was studied and new compound with

compositions $[\text{UO}_2\text{CrO}_4(\text{C}_5\text{H}_4\text{NHCOO})] \cdot \text{H}_2\text{O}$ (I) ($\text{C}_5\text{H}_4\text{NHCOO}$ – piridin-4-carboxylic acid) and $[\text{UO}_2\text{CrO}_4(\text{C}_5\text{H}_4\text{NHCOO})] \cdot 0.25\text{H}_2\text{O}$ (II) ($\text{C}_5\text{H}_4\text{NHCOO}$ – piridin-3-carboxylic acid) were obtained. The structures of I and II were studied by X-ray diffraction. Both compounds crystallize in the monoclinic crystal system. The unit cell parameters for I: $a = 7.5025$, $b = 11.5188$, $c = 13.0518$ Å, $\beta = 97.877^\circ$, $V = 1117.3$ Å³, space group $P2_1/n$, $Z = 4$, $R_f = 0.0263$ (3840 reflections); and for II: $a = 7.2362$, $b = 13.8847$, $c = 10.7204$ Å, $\beta = 90.037^\circ$, $V = 1077.1$ Å³, space group $P2_1/n$, $Z = 4$, $R_f = 0.0236$ (5224 reflections).

The coordination polyhedron of the uranium atom in both structures I and II has the shape of a UO_2O_5 pentagonal bipyramid. In structure I three equatorial oxygen atoms belong to three tridentate chromate ions (T^3 type) and another two oxygen atoms belong to two bidentate bridging molecules of isonicotinic acid (B^2 type), which occupy trans positions in relation to each other in equatorial plane of uranyl ion. The main structural unit of I is a layer $[\text{UO}_2\text{CrO}_4(\text{C}_5\text{H}_4\text{NHCOO})]$ belonging to the AT^3B^2 crystal chemical group, ($A = \text{UO}_2^{2+}$, $T^3 = \text{CrO}_4^{2-}$, $B^2 = \text{C}_5\text{H}_4\text{NHCOO}$ molecules). The designations of coordination types and crystal chemical formulas are given in accordance with [3]. Layers are linked in framework by system of hydrogen bonds, which include outer sphere water molecules. In structure II chromate ions also have tridentate coordination and nicotinic acid molecules are bidentate chelate (B^{01} type). The main structural unit of II is a chain $[\text{UO}_2\text{CrO}_4(\text{C}_5\text{H}_4\text{NHCOO})]$, belonging to the AT^3B^{01} crystal chemical group, ($A = \text{UO}_2^{2+}$, $T^3 = \text{CrO}_4^{2-}$, $B^{01} = \text{C}_5\text{H}_4\text{NHCOO}$ molecules).

Influence of nature of oxoanion and type of isomer on the structure of complexes of uranyl sulfate and chromate with some isomers of pyridinecarboxylic acid was discussed.

This study was supported by the Ministry of Education and Science of the Russian Federation (project no. 02.740.11.0275).

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Keywords: uranyl, structure

MS61.P09

Acta Cryst. (2011) **A67**, C606-C607

Complexes containing coordination centre OSiC_3X ($\text{X} = \text{Cl}$, Br) based on N-organosulfonyl-2-aminoacids

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Complexes with a coordination centre OSiC_3Cl obtained from N-organosulfonyl-2-aminoacid containing three biologically active moieties (sulphonamide group, the residue of amino acid, and the five-membered O-Si-chelate ring) were studied by x-ray diffraction.

The structural characteristics of the coordination polyhedron of the silicon atom in these complexes and the influence of crystal packing on their molecular structure were analyzed.

In the case of $\text{X} = \text{Cl}$ the coordination polyhedron of the silicon atom correspond to a distorted trigonal bipyramid. The deviation of the silicon atom from the plane of equatorial substituents varies in the range from $-0.0408(8)$ to $0.0809(3)$ Å (sign “-” means that the Si atom deviates towards the Cl atom). The Si-O bond length depends on the electron-acceptor properties of N-organosulfonylprolin substituent; the smallest value corresponds to the compound **1** ($R = \text{Me}$), and the largest to the compound **2** ($R = \text{Ph}$). The changes in the interatomic Si ... O distances are those for Si ... Cl are antibate ($1.924(2)$ - $2.007(16)$ and $2.256(15)$ - $2.346(11)$ Å, respectively). The strongest intermolecular