

MS14-P20 | MODULAR STRUCTURES OF LAYERED URANYL MINERALS AND SYNTHETIC COMPOUNDS

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There are many ways to describe topology of polyhedral complexes in the structures of uranyl compounds, one of them is a modular approach. The $[(\text{UO}_2)(\text{T}^{6+}\text{O}_4)(\text{H}_2\text{O})_n]^0$ ($\text{T} = \text{Cr}^{6+}, \text{S}^{6+}, \text{Se}^{6+}, n = 0-2$) chains are the building block for a numbers of layers. Uranium compounds obtained from aqueous solutions often inherit fundamental building blocks. The layers in the structures of uranyl selenates can be obtained by the self-assembly of the $[(\text{UO}_2)_2(\text{SeO}_4)_4(\text{H}_2\text{O})_4]^{4-}$ complexes. This approach will be generalized for all layered uranyl compounds with TO_4 ($\text{S}^{6+}, \text{Se}^{6+}, \text{Cr}^{6+}, \text{Mo}^{6+}, \text{P}^{6+}, \text{As}^{6+}$) tetrahedra in this contribution.

Tetramers $[(\text{UO}_2)_2(\text{TO}_4)_4(\phi)_4]^{4-}$ ($\phi = \text{O}, \text{H}_2\text{O}, \text{F}, \text{Cl}, \text{OH}$) in uranyl compounds are binding by free vertexes of TO_4 tetrahedra to form three types of fundamental chains. Chains connected by vertex of uranium and TO_4 polyhedral form layers with different $\text{UO}_2:\text{TO}_4 = 1:2, 2:3, 3:5, 4:7, 5:8$ ratios. Thus, the layers are modular units built from separate chains.

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