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# MICROSCOPIC MODEL OF CRYSTALLOGENESIS FROM AQUEOUS SOLUTIONS OF URANYL SELENATE

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*119991, Москва, Ленинский пр., 31*

On the basis of experimental studies of crystallization products from aqueous solutions of uranyl selenate, a model of microscopic crystallogenesis has been suggested that is based upon the following principles. 1. Prenucleation structural building units in uranyl selenate solutions are cyclic tetramers or 4-membered rings of U and Se coordination polyhedra. 2. Crystallogenesis from the uranyl selenate aqueous solutions is a many-step process that involves formation of intermediate metastable structures based upon cyclic tetramers. Transition between different structures is solution-mediated and involves a dissolution-reprecipitation mechanism. Structural evolution is towards complexes of increasing dimensionality. 3. In organically templated systems, crystallogenesis involves self-assembly of organic and inorganic substructures. For short-chain and branched diamines, a principle of hydrophillic and hydrophobic zones plays an important role, whereas, for long-chain amines, formation of cylindrical or 2-D block micelles is observed. The model suggested can be used for investigations of nanoscale self-assembly processes in uranium-based systems in order to create nanostructured uranium oxysalt materials.