SYNTHESIS AND STUDY OF URANIUM-CONTAINING COMPOUNDS OF ALANINE AND GLYCINE

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The development of new hybrid organometallic materials remains a promising area of research, since these compounds have unique properties that can be used in advanced technologies. Crystalline hybrid materials such as metal organic framework, which have been the subject of numerous studies, given the tunability of metal centers, as well as coordination ligands. Initially, these materials were studied because of their vast gas storage capabilities, but more recently research has expanded, including the development of catalytic reactors, sensors, and separation membranes.

The crystalline technology of hybrid materials through supramolecular interactions, such as hydrogen bonds and π-π interactions is another well-studied area that initially focused on interactions with small molecules, but was expanded to include new nanoparticle and biomolecule compositions, mesoporous materials and metallic organic nanotubes.

We studied the ways of interaction of the uranyl oxo group in supramolecular interactions and investigated the role of charge-supported hydrogen bonds for the formation of new hybrid uranyl materials. This type of interaction with the uranyl cation and amide functional groups of proteins is observed and can play a significant role in the bio-coordination and transfer of uranium in biological systems. For this study, we chose two zwitterionic Proteinogenic amino acids, glycine (Gly) and L-alanine (Ala), as organic ligands due to their zwitterionic nature and obtained three new uranyl-hybrid compounds: $[(UO_2)_3(Gly)_2(O)_2(OH)_2](H_2O)_6$ (**1**), $[(UO_2)_5(Gly)_4(O)_3(OH)_3](NO_3)(H_2O)_{12}$ (**2**) and $[(UO_2)_3(Ala)_2O(OH)_3](NO_3)(H_2O)_3$ (**3**).We also studied the phase formation of these compounds, carried out a factor-group analysis and investigated thermal behavior including thermal expansion.