27th International Chugaev Conference on Coordination Chemistry

and

4th Young Conference School "Physicochemical Methods in the Chemistry of Coordination Compounds"

October 2–6, 2017, Nizhny Novgorod

The Conference celebrates the 80th birthday of Academician Gleb A. Abakumov

BOOK OF ABSTRACTS

Nizhny Novgorod

27th International Chugaev Conference on Coordination Chemistry
4th Conference-School for Young Researchers "Physicochemical Methods in Coordination Chemistry"
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FORMING OF SUPRAMOLECULAR SALTS BASED ON THE HYDROXYCARBOXYLATOGERMANIC ACIDS AND NITROGEN-CONTAINING ORGANIC MOLECULES

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The modern stage of development of supramolecular chemistry is characterized by the appearance of a significant number of publications devoted to the study of various chemical systems, which self-organize due to non-covalent, in particular, hydrogen bonds.

As building blocks of such supramolecular architectures, in aqueous solution we have established stable hydroxycarboxylatogermanate acids (GeHoca) (biscitrate -$H_2[Ge(HCit)_2]$, tartrate-$H_2[Ge_2(\mu\text{-}Tart)_2(OH)_2]$, xylarate-$H_2[Ge(H_2Xylar)_2]$ nitrogen-containing organic molecules (L= nicotinic acid, nicotinamide, isonicotinic acid hydrazide, diphenylguanidine, diantipyrylmethane, cytosine, imidazole, 1,10-phenanthroline, 2,2'-bipyridine). From all systems which contained these molecular components, products with the same molar ratio GeHoca:L=1:2 and composition $(HL)_2[GeHoca]\cdot nH_2O$ were obtained. It was established, that they are ionic associates, cations of which are monoprotonated forms of HL^+ (independently from the number of atoms capable for protonation in L molecules) and complex hydroxycarboxylatogermanate anions with the same structure as in the starting acid [1-5].

In the monomeric complex anions the coordination polyhedron of the Ge atom is a distorted octahedron formed by six O atoms of two tridentate chelating ligands. In the dimeric anion $[Ge_2(\mu\text{-}Tart)_2(OH)_2]^{2-}$ the metal atoms are bound to two completely deprotonated ligands $Tart^{4-}$. The coordination of each Ge atom is completed to trigonalbipyramidal by the O atom of the hydroxy ligand in the axial position.

There was carried out the analysis of the obtained data and it was revealed that the type of crystal structure (stratified, three-dimensional net) of the studied supramolecular salts determines the steric and topological features of building blocks, their ability to electrostatic interaction and the formation of hydrogen bonds with the participation of crystallization water.

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