

**DSCM 9P ABOUT HYDROLYTIC STABILITY OF THE CHELATE COMPLEXES
[SiF₄(2,2'-Bipy)] AND [SiF₄(1,10-Phen)]**

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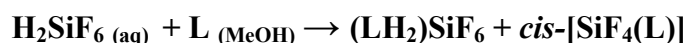
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The products of reaction of fluorosilicic acid (FSA) with organic bases, the fluorosilicates of the relevant "onium" cations, find an application as anti-carries agents, ionic liquids, reagents for modified zeolite catalytic agents, in the synthesis of the complexes of silicon tetrafluoride, fungicides, or in preparation of herbicide-containing mixtures [1]. On the other hand these compounds are of interest for stabilization of various fluorido complexes of silicon, the products of the hydrolytic transformations of FSA [2].

In the process of study of FSA interaction with bidentate ligands L = 2,2'-bipyridine (2,2'-Bipy) and 1,10-phenanthroline it was found that the products of reactions are mixtures of the corresponding hexafluorosilicates and molecular *cis*-chelate silicon tetrafluoride complexes:



In the case of reaction system H₂SiF₆ – 2,2'-Bipy – H₂O – MeOH both products of interaction – salt (2,2'-BipyH₂)SiF₆ (**I**) as a dominant form and complex *cis*-[SiF₄(2,2'-Bipy)] (**II**) as a by-product were identified by X-ray crystallography:



It is known that the silicon tetrafluoride complexes with *N*-donor ligands reveal extremely low hydrolytic stability, therefore their synthesis by interaction of SiF₄ with ligands is carried out in anhydrous solvents or in gas phase [3]. Even in the humid air complexes tend to be converted into the corresponding hexafluorosilicates. Evidently, the detection of complex **II** as a by-product of **I** crystallized from organic-aqueous solution, is provided by the chelating ligand effect. Compound **II** represents the first structurally confirmed example of molecular complex formed by SiF₄ with *N*-donor ligand separated from the mixed aqueous-organic medium, which retains its structure after recrystallization from aqueous solution.

[1] Gelmboldt V. O. "Onium" Fluorosilicates: Structures, properties, applications (Russ.). Odessa: Astroprint, 2012.

[2] Gelmboldt V. O., Ganin Ed. V., Fonari M. S., J. Fluorine Chem. 135 (2012) 15-24.

[3] Voronkov M. G., Gubanova L. I., Main Group Metal Chem. 10 (1987) 209-286.