

ON SOME ASPECTS OF CHEMISTRY OF HALOGEN FLUORIDES

V. F. Suchoverchov

Institute of General and Inorganic Chemistry, Academy of Sciences U.S.S.R., Moscow (U.S.S.R.)

In the paper, an attempt to give a general examination of the state of the halogen fluorides chemistry and to show the progress achieved nowadays in some of its parts such as synthesis, analysis, structure, physicochemical properties, hydrolysis, use as analytical reagents etc. has been done.

Special attention of chemists was paid to synthesis of fluorohalogenates and products with polihalogen cations in connection with the search of the stable compounds containing active fluorine and having high oxidational and fluorinating properties. At present more than 90 derivatives of halogen fluorides with ions Cl_2F^+ , XF_2^+ , XF_4^+ , XF_6^+ , ClF_2^- , BrF_6^- , XF_4^- ($\text{X}=\text{Cl}$, Br , I) have been obtained. The attempts to prepare the cationic complexes with BrF and IF have failed. There are no evidences of existence of the compounds with anions XF_2^- ($\text{X}=\text{Br}$, I), ClF_6^- , XF_8^- ($\text{X}=\text{Cl}$, Br , I).

Since in addition to fluorides the other halogenides, oxides, salts of oxygenated acids can be used as the initial reactants for complex halogen fluorides syntheses, the reaction accompanying by volatile products formation, the necessity to analyse the gas mixtures arises. The presence of water in the reactants makes it necessary to study the phenomenon of hydrolysis of halogen fluorides. The investigation of all these processes has led to proposition of the rational methods of its chemical analysis. The certain success has been attained in the investigation of structure of halogen fluorides and its derivatives by means of gas electronography, X-ray diffraction, Raman-, IR- and NMR-spectroscopy.

The halogen fluorides (BrF_3 , ClF_3 , BrF_5 , ClF_5) proved to be attractive due to the possibility of using them as reactants for evolution and analysis of oxygen, silicon, carbon, sulphur in the form of volatile fluorides or free elements. Such methods are intensively used while solving geological problems.