

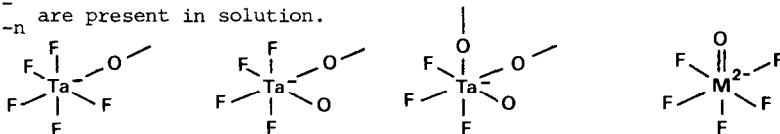
BASIC HYDROLYSIS OF Nb(V) and Ta(V) FLUORIDES IN HF-AQUEOUS SOLUTIONS

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Composition and structure of fluoride complexes of Nb and Ta in neutral and basic aqueous solutions of HF have been studied by ^{19}F NMR. It is shown that in acid solutions of HF (pH=2) with ratio F:Nb=5, Nb exists predominantly in the form of $\text{NbOF}_4(\text{H}_2\text{O})^-$. With the increasing of the basicity the equilibrium is displaced towards NbOF_5^{2-} as a result of the increasing of F^- activity; accordingly the hydrolysis is extended and $\text{NbOF}_3(\text{H}_2\text{O})_2$ is formed.

While the hydrolysis of Nb(V) fluorides leads to formation of double bonding Nb=O, the hydrolysis of Ta(V) fluorides proceeds via formation of bridge bonds Ta-O-Ta in $\text{Ta}_2\text{OF}_{10}^{2-}$, $\text{Ta} \begin{array}{c} \diagup \text{O} \diagdown \\ \diagdown \text{O} \diagup \end{array} \text{Ta}$ in $(\text{TaO}_2\text{F}_4)_n^{n-}$ (n=2-4) and $\text{Ta} \begin{array}{c} \diagup \text{O} \diagdown \\ \diagdown \text{O} \diagup \end{array} \text{Ta}$ in $\text{Ta}_2\text{O}_3\text{F}_6^{2-}$. Along with dimeric and polymeric forms, monomeric complexes $\text{TaOF}_n(\text{OH})_{5-n}^{2-}$ are present in solution.



Mechanisms of extraction of fluoride compounds of Ta and Nb with tributylphosphate from the neutral and basic aqueous solutions were studied. The influence of the extraction process on equilibrium between fluoride complexes of Ta and Nb in aqueous solution has been studied.

1 Ju.A. Buslaev, E.G. Ilyin, *Koord. Chim.*, **2** (1975).

2 E.G. Ilyin, A.N. Zozulin, Ju.A. Buslaev, *D.A.N.*, **296** (1987).