

INFLUENCE OF ANION OF A MINERAL ACID ON THE RATE OF IRON(III)-NITRITE-THIOCYANATE REACTION

For kinetic spectrophotometric determination of iodine in form iodide use iron(III)-nitrite-thiocyanate reaction at 313 K.

At the use of wet acid mineralization of samples with an organic matrix there is a question about the choice of acid for treatment. At the choice of oxidant it is necessary to take into account not only oxidizing ability of acids or their mixtures and also to take into account influence of chemical nature of anions of acids on next determination.

In this work investigated at 293 K and 313 K influence of concentration of anions of mineral acids (sulfate, chloride and nitrate) on flowing of iron(III)-nitrite-thiocyanate reaction that is catalyzed by the ions of iodide.

It was set that by the result of introduction at 293 K in the system of growing amount of ions of sulfate acid there is a decline of exit of indicatory complex FeSCN^{2+} and deceleration of catalytic reaction up to her practically complete halt. This is due to the change of activity coefficients of reaction components and susceptibility of iron(III) to form complexes with sulfat-ions. Introduction the increasing amounts of chloride or nitrate (293) has virtually no effect on the output indicator set FeSCN^{2+} , but accelerates the catalytic reaction to speed its progress at 313 without additives anions. A growing number of nitrate at 293 K does not affect the output indicator set FeSCN^{2+} , but accelerates the progress of catalytic reactions. It is suggested that the addition of salts of mineral acids, changes in the coordination sphere thiocyanate complexes of iron(III), and thus is a change in the redox potential of the system. It results in a decline or increase of speed of redox reaction, and therefore to the need to observe the same salt as background in determining iodide and the construction of calibration graphs. Thus, the rate of catalytic iron(III)-nitritetiosianate response correlates with the ability of complexing anions of strong mineral acids relative to iron(III). Optimization of experimental conditions for the flow of iron(III)-nitrite-thiocyanate reaction conditions allows the determination iodine in form iodide at room temperature.

Key words: iron(III), nitrite, thiocyanate, iodide, sulfate, chloride, nitrate.