O. Trohimenko, PhD, trohimenko@univ.kiev.ua, V. Sukhan, Dr. Sci.
Taras Shevchenko National University of Kyiv, Kyiv

OPTIMIZATION OF CATALYTIC IRON(III)-NITRITE-THIOCYANATE METHODS OF DETERMINATION OF TOTAL IODINE IN THE SAMPLES WITH AN ORGANIC MATRIX

For kinetic determination of iodine in samples with organic matrix is widely used of Ce(IV)-As(III) and Fe(III)-NO_2^--SCN^- reactions, catalyzed by iodine in the form of iodide. Rapid discoloration of the solutions when performing their manual way is a complication of catalytic spectrophotometric methods of analysis. This complication affects the reproducibility of the results. To improve the metrological characteristics of the mentioned techniques necessary to carry out the repetition of the definition. The optical density of solutions significantly depends on minor variations in temperature, duration of the reaction, small deviations of the fixed-time monitoring of the progress of the reaction.

Purpose of this work is optimization of the catalytic Fe(III)-NO_2^--SCN^- methods determining of iodine in the form of iodide for determination of total iodine in samples with organic matrix after high-temperature alkaline dry mineralization of samples using K_2CO_3.

In the work reduced the nitrite concentration to reduce the dependence of optical density of solutions on the duration of the reaction. With an excess of Fe(III) decrease the rate of decolorization of solutions by reducing the concentration of nitrite in 100 times and maintaining the concentrations of other reagents, can be explained by absence under these conditions the redox interaction between the anions SCN^- and NO_2^-. It is established that optimal are the following concentrations of reagents: $C(HNO_3)=0.5$ M; $C(KSCN)=2.5.10^{-3}$ M; $C(Fe(III))=0.035$ M; $C(NaNO_2)=5.10^{-4}$ M. An important advantage of the technique is a slight dependence of analytical signal on-time of the reaction.

Keywords: total iodine, catalytic methods of analysis, basic sample preparation.