

IODIMETRIC SOLID-SPECTROPHOTOMETRIC DETERMINATION OF THIOCYANATE USING POLYURETHANE FOAM AS A SORBENT

Solid phase method iodometric-spectrophotometric determination of thiocyanate in water was developed. Thiocyanate is oxidized by means of iodate at 313 K for 30 min. in a medium of 0.02 M sulfuric acid to sulfate. Then poured excess iodide. Iod adsorb on polyurethane foam. Absorption foam tablets record by solid-phase spectrophotometry relative to the starting foam tablets. Absorption foam is treated by heterochromatik extrapolation. For analytical signal taking values $\Delta A = A_0 - A_x$ at 370 nm, where A_0 – absorbance value of zero (blank) sample in the absence of thiocyanate at $C_{I_03} = 1.6 \cdot 10^{-6}$ M, A_x – the value of optical density foam in giving system a certain amount of thiocyanate. Calibration curve described by the equation: $\Delta A = (-8.67 \pm 3.16) \cdot 10^{-3} + (3.79 \pm 0.06) \cdot C$ ($R^2 = 0.998$), where C – concentration of thiocyanate, mg/dm³. The linearity of the calibration curve to the observed concentration of thiocyanate in water sample with 0.10 dm³ volume of 8.0 cm³ sample aliquot. The detection limit, which is calculated by the 3 σ -criterion is 3 mkg/dm³. The linearity of the calibration curve observed to the concentration of thiocyanate in water sample to 0.10 mkg/dm³ (aliquot of sample is 8.0 cm³). The detection limit, which is calculated by the 3 σ -criterion is 3 mkg/dm³.

Sorption of hydrophobic Iodine on polyurethane foam is quite selective. Components of water that do not affect the state of the molecular Iodine in aqueous solution, a significant effect on the extraction of iodine by foam does not show.

Identification of 0.2 mg/dm³ thiocyanate not interfere with sulphates and chlorides of alkali and alkaline earth metals in quantities that are usually present in surface waters and humic acid in their saturated solutions (about 1 mg/dm³). The salts of Cu(II) and Fe(III) interfere with determination as they oxidize iodide and binding SCN⁻ in complexes. In the presence of $8 \cdot 10^{-3}$ M fluoride does not prevent the determination of iodine 40 mkg/cm³ Fe(III). Interfering effect of Mn(II) is caused by its reaction with iodate in sulfate medium. Pb(II) is a clouding of the solution due to the formation of insoluble lead sulfate. Interfering effect of ≥ 400 mkg/cm³ nitrite is eliminated introduction 1.0 cm³ of 0.5 M solution of sulfamic acid. Sulfide, sulfite and cyanide, reducing iodate, also interfere with the determination. However, their influence is largely eliminated by blowing nitrogen through acidified with sulfuric acid test solution. Fluorides, chlorides, bromides, nitrates, sulfates, phosphates and arsenates are not interfere at levels ≤ 200 mkg/cm³.

Key words: thiocyanate, solid phase extraction, polyurethane foam.