

ABSTRACT

This thesis was focused on a development of sensitive determination of cationactive tenzides by using the flow injection analyses with spectrofluorimetric detection. The determination was based on an interaction of cationactive tenzides with sodium salt of 4,5,6,7-tetrachloro-2',4',5',7'-tetraiodofluorescein dye (Bengal red) that generates a soluble associate in water environs. The sodium salt of 4,5,6,7-tetrachloro-2',4',5',7'-tetraiodofluorescein is a fluorescence-active compound. A decrease of fluorescence intensity is detected as a result of the formation of fluorescence-inactive associate. A development of the determination proceeded in two steps.

At first a static method of the determination was developed. Cetyltrimethylammonium bromide (CTAB) and N-(α -karbethoxypentadecyl)trimethyl ammonium bromide (Septonex) were used as a standard for cationactive tenzides. An optimal theoretical concentration of Bengal red dye ($5 \cdot 10^{-5}$ mol/l) was found, an optimum rate of pH for the fluorescence of Bengal red dye (pH = 9) was found, and a suitable kind of buffer for the environs of the interactions (25 mM phosphate buffer) was found. A linear dynamic range for the determination (Septonex) was in the interval: the limit of quantification - $7 \cdot 10^{-5}$ mol/l. The limit of quantification was $3,72 \cdot 10^{-6}$ mol/l.

Next a device for the flow injection analyses with two canals was developed. The conditions of the determination were optimized (reaction coil length 60 cm, volume of dosing loop 250 μ l, flow rate of the canal with Bengal red 2,6 ml/min, flow rate of the canal with deionized water 3,1 ml/min). A linear dynamic range was in the interval: the limit of quantification - $2 \cdot 10^{-4}$ mol/l (Septonex and CTAB). The limit of quantification was $5,41 \cdot 10^{-6}$ mol/l (CTAB) and $9,26 \cdot 10^{-6}$ mol/l (Septonex).

Finally the developed method was tested on the cationactive tenzides determination by using spiked samples of drinking water.

Keywords

Tenzides

Fluorescence

Spectrofluorimetric detection

Flow injection analysis, FIA

Bengal red

Septonex

CTAB