Methods and objects of chemical analysis, 2015, Vol. 10, No. 2, 61-66

Determination of the Content of Sulfate Ions in Drinking and Mineral Waters and Oxalate Ions in Tea with Direct Potentiometry Method

E.M. Rakhman'ko[1], Yu.V. Matveichuk[2]*

[1] Belarussian State University, Leningradskay, 14, 220030, Minsk, Belarus;
[2] Mogilev State University of Food Technologies, Shmidta, 3, 2120127, Mogilev, Belarus;
*e-mail: Yu_Matveychuk@mail.ru

Recieved: January 20, 2015; Accepted: June 8, 2015

The analytical methods for determining oxalate and sulfate ions in tea, mineral and drinking waters, respectively, with direct potentiometry in a variant of the calibration curve using film oxalate and sulfate-selective electrodes based on the higher of quaternary ammonium salts, which membrane plasticized with 1-bromonaphthalene, were developed. To increase the affinity of the hydrophilic SO_4^{2-} and $C_2O_4^{2-}$ ions to the hydrophobic phase of the membrane and to increase of the electrode selectivity to basic ion ($C_2O_4^{2-}$ and SO_4^{2-}) was injected into the neutral carrier membranes - heptyl ester n-trifluoroacetylbenzoic acid. The relative deviation Sr results of detection sulfate ions in drinking and mineral waters is 4-9%, the oxalate ions in tea is not more than 7% and is not more than 5% (as determined by the method of additives). Gravimetric determination of sulphate ions as the reference methods of analysis was used. Accuracy and reproducibility of results of $C_2O_4^{2-}$ ions determination were tested with additive method with followed diluting.

Keywords: ion-selective electrode, direct potentiometry, oxalate ions, sulfate ions, quaternary ammonium salts