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## INDICATOR SYSTEM "Zr(IV)-ARSENAZO I" IMMOBILIZED ONTO AEROSIL FOR THE DETERMINATION OF FLUORIDE IN WATER, CARE PRODUCTS FOR THE ORAL CAVITY AND DIETARY SUPPLEMENTS

*The complex of Zr(IV) with Arsenazo I has been immobilized onto organo-mineral strongly acidic anionite obtained by adsorption of tetradecylammonium bromide onto the surface of aerosil. Capacity of the anionite relatively complex that corresponds to the chemisorption was found to be  $5.0 \mu\text{mol g}^{-1}$ . Multilayer sorption of the complex starts at a concentration more than  $5.0 \text{ mmol L}^{-1}$ . The electrostatic immobilization mechanism has been proven. A color of the complex immobilized changes from purple to red upon the addition of fluoride. This effect could be attributed to the replacement of the Arsenazo I molecule with fluoride, which has a high affinity to Zr(IV). Analytical response turned to be maximum value under the conditions when the ratio of volume of the fluoride solution to mass of the complex Zr(IV) with Arsenazo I immobilized onto modified with tetradecylammonium bromide aerosil was  $100 \text{ ml g}^{-1}$  and the  $\text{pH}=1.7$ . Diffuse reflectance spectrometry has been proposed for the determination of fluoride in solution. The method is based on the measuring of the spectra of the diffuse reflectance of the complex immobilized after its interaction with fluoride solution. The detection limit and the range of linearity were found to be  $0.02 \text{ mg L}^{-1}$  and  $0.04\text{--}1.00 \text{ mg L}^{-1}$ , respectively. The characteristics of the analytical performance of the method proposed have been determined. The effect of foreign components from objects of analysis on the determination of fluoride has been studied. The influence of hydrophosphates and sulfates has been masked with Barium chloride. The proposed method has been successfully applied to analyses of bottled water, care products for the oral cavity and dietary supplements. The results obtained are shown to be reproducible and reliable.*

*Keywords: fluoride, Arsenazo I, Zirconium, quaternary ammonium salt.*