

Kinetic Spectrophotometric Determination of Total Iron by Sequential Injection Analysis

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A new, simple and highly sensitive kinetic spectrophotometric method for the determination of total iron by sequential injection analysis (SIA) has been proposed. The determination was based on the catalytic effect of potassium bromate on the oxidation of diaminoditolyI. The absorbance of the investigated chemical system, measured at the wavelength of 639 nm, was used to determine the amount of total iron. Chemical and physical conditions for the applied SIA method have been optimized and, after that, the calibration plot was constructed in the analyte concentration range of 0.035–0.700 $\mu\text{g mL}^{-1}$. Detection limit of iron was 5 $\mu\text{g L}^{-1}$. Relative standard deviation for 11 replicate determinations of 0.25 $\mu\text{g mL}^{-1}$ Fe(III) was 1.1% at a throughput of 27 samples per hour. The method was applied to the determination of total iron in tea, human hair and pharmaceutical formulation. The results obtained by the proposed method were compared with those obtained by FAAS. The t-test did not reveal any significant differences between the two methods at the confidence level of 95%.