

Fluorimetric Determination of Iodate Based on Cyclodesulfurization of Thiosemicarbazide with Incorporated Fluorescein

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Keywords: Iodate; Thiosemicarbazide; Fluorescein; Fluorimetry

A simple fluorimetric method for determination of iodate in table salt has been developed. The method is based on the reaction of iodate with excess iodide in acidic media which leads to the formation of iodine and subsequently to tri-iodide (I_3^-). I_3^- induces cyclodesulfurization of non-fluorescent fluorescein-based thiosemicarbazide (FTC) and leads to the formation of the corresponding 1,3,4-oxadiazole, a colored and fluorescent product. During this process a spirocyclic ring of FTC is opened what causes the appearance of color and strong fluorescence emission. Based on this mechanism, a simple fluorimetric method for determination of iodate has been developed. Fluorescence increases linearly with iodate concentration in the range 20–800 nmol L⁻¹. The detection limit was estimated as 6.0 nmol L⁻¹ (3 σ). The proposed method has been applied to the determination of iodate in table salt with satisfactory results.