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SPECTROPHOTOMETRIC DETERMINATION OF BROMATE IN DRINKING WATER USING A MULTI-SYRINGE FLOW INJECTION SYSTEM

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The potential presence of bromate in drinking water is a public health issue, due to its recognised carcinogenicity. The disinfection process by ozonation induces the oxidation of bromide ions to bromate, leading to the formation of toxic compounds.

In the present work, a multi-syringe flow injection system for the determination of bromate in drinking water is described. The determination is based on the spectrophotometric detection of a colored cation, resulting from the oxidation of phenothiazine compounds in the presence of bromate, in acidic medium. After studying the influence of the physical parameters in the flow system performance, different phenothiazine compounds were evaluated. A higher sensitivity and a lower detection limit was attained using chlorpromazine. Interference from nitrite, hypochlorite and chlorite was observed for all phenothiazines tested.

The proposed methodology allowed the in-line elimination of interferences, without changes in the manifold configuration and the determination of bromate within a range between 25 and 750 $\mu\text{g L}^{-1}$, with a detection limit of 7 $\mu\text{g L}^{-1}$, good precision (RSD < 1,6%, n = 10), with a determination frequency of 35 h⁻¹.

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