PRESS RELEASE FOR IMMEDIATE PUBLICATION

Simplified analysis of total sulfite in foodstuffs

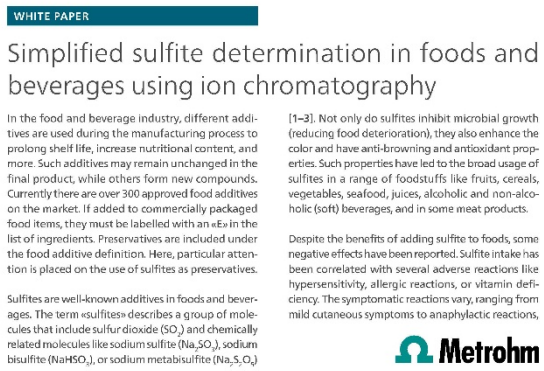
Free white paper presents two improved IC methods

Herisau, April 2021.
Determination of total sulfite in liquid and solid foodstuffs is a critical, yet challenging application. A free Metrohm white paper presents 2 improved methods for simplified sulfite analysis using ion chromatographic separation followed by amperometric (method 1) and conductivity detection (method 2). While method 2 is ideally suited for higher sulfite concentrations in foods with low organic load, method 1 excels due to detection limits as low as 0.2 mg/kg as well as outstanding signal stability and repeatability of results for almost all food matrices and varying sulfite concentrations.

Current methods for sulfite analysis are either complex to apply and not reliable (Monier-Williams method) or require frequent cleaning of the working electrode (electrochemical detection applying direct current after ion chromatographic separation). The improved IC methods presented in the present white paper excel due to several reasons:

- A more alkaline stabilization solution is used in method 1 allowing the determination of total sulfite in almost all food matrices.
- A high capacity anion exchange column is used instead of an ion exclusion column for short, stable retention times and good peak shapes.
- Method 1 uses amperometric detection applying a special potential sweep (patent filed) that completely reconditions the electrodes after only 2 minutes thus overcoming the otherwise required frequent cleaning.

The white paper can be downloaded free of charge from the Metrohm website.


WHITE PAPER

Simplified sulfite determination in foods and beverages using ion chromatography

In the food and beverage industry, different additives are used during the manufacturing process to prolong shelf life, increase nutritional content, and more. Such additives may remain unchanged in the final product, while others form new compounds. Currently there are over 300 approved food additives on the market. If added to commercially packaged food items, they must be labelled with an «E» in the list of ingredients. Preservatives are included under the food additive definition. Here, particular attention is placed on the use of sulfites as preservatives.

Sulfites are well-known additives in foods and beverages. The term «sulfites» describes a group of molecules that include sulfur dioxide (SO_2) and chemically related molecules like sodium sulfite (Na_2SO_3), sodium bisulfite ($NaHSO_3$), or sodium metabisulfite ($Na_2S_2O_5$) [1–3]. Not only do sulfites inhibit microbial growth (reducing food deterioration), they also enhance the color and have anti-browning and antioxidant properties. Such properties have led to the broad usage of sulfites in a range of foodstuffs like fruits, cereals, vegetables, seafood, juices, alcoholic and non-alcoholic (soft) beverages, and in some meat products.

Despite the benefits of adding sulfite to foods, some negative effects have been reported. Sulfite intake has been correlated with several adverse reactions like hypersensitivity, allergic reactions, or vitamin deficiency. The symptomatic reactions vary, ranging from mild cutaneous symptoms to anaphylactic reactions,

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The white paper presents two improved IC methods for total sulfite analysis in foodstuffs.

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Image:

About Metrohm

Metrohm is one of the world's most trusted manufacturers of high-precision instruments for laboratory and process analysis. The company was founded in 1943 by engineer Bertold Suhner in Herisau, Switzerland, where it is headquartered to this day. Metrohm offers a comprehensive portfolio of analytical technologies ranging from titration and ion chromatography to near-infrared and Raman spectroscopy, as well as several other techniques. Metrohm sells its products and provides services through its own local subsidiaries and exclusive distributors in more than 120 countries worldwide. Our mission in a nutshell is helping customers from virtually every industry analyze and maintain the quality of their products at every stage in the manufacturing process and beyond. Since 1982, Metrohm has been owned 100% by the non-profit Metrohm Foundation. This foundation keeps to its purpose to support charitable, philanthropic, and cultural projects in eastern Switzerland and, above all, ensure the independence of the company.

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