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應用手冊

The Determination of Sucralose in Flavored Waters using CORTECS 2.7 µm C_{18} Chemistry and Refractive Index Detection

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This is an Application Brief and does not contain a detailed Experimental section.

Abstract

To accurately quantify the sucralose content of flavored waters with minimal sample preparation, utilizing refractive index (RI) detection for routine quantitative analysis in a quality control environment.

Benefits

Isocratic separation using CORTECS 2.7 µm C_{18} Chemistry, Alliance HPLC Technology and refractive index detection results in a simple and cost effective system for the quantification of sucralose in flavoured waters.

Introduction

Sucralose (E955) is an artificial sweetener which is manufactured by the selective chlorination of sucrose. The majority of ingested sucralose is not broken down by the body which makes it noncaloric and widely used in sugar-free products. In routine food and beverage quality control analysis, sucralose poses a challenge as it has no chromophore which makes traditional HPLC-UV detection inappropriate for its analysis.

This application brief describes the analysis of sucralose in flavored waters utilizing a simple isocratic separation on the Alliance HPLC System with CORTECS C_{18}, 90Å, 2.7 µm Chemistry and refractive index detection.

Results and Discussion

The analysis was performed on an Alliance HPLC System using a CORTECS C_{18} Column, 90Å, 2.7 µm, 4.6 x 100 mm (p/n 186007377) with a mobile phase composition of 80:20 ultrapure water and methanol (HPLC-grade), a flow rate of 1 mL/min and a column temperature of 30 °C. A volume of 50 µL was injected and the 2414 Refractive Index (RI) Detector was set to a temperature of 30 °C with the sensitivity setting increased to 8 to allow

the required detection limit of 50 ppm to be easily reached. A four point standard calibration curve in ultrapure water was prepared in duplicate by two different analysts over two consecutive days from freshly weighed stock solutions using a sucralose reference standard (≥98% purity). Figure 1 shows the linear calibration curve achieved for the calibration lines ranging from 50 ppm to 500 ppm, acquired in duplicate, Figure 2 shows an

example of a 100 ppm standard.

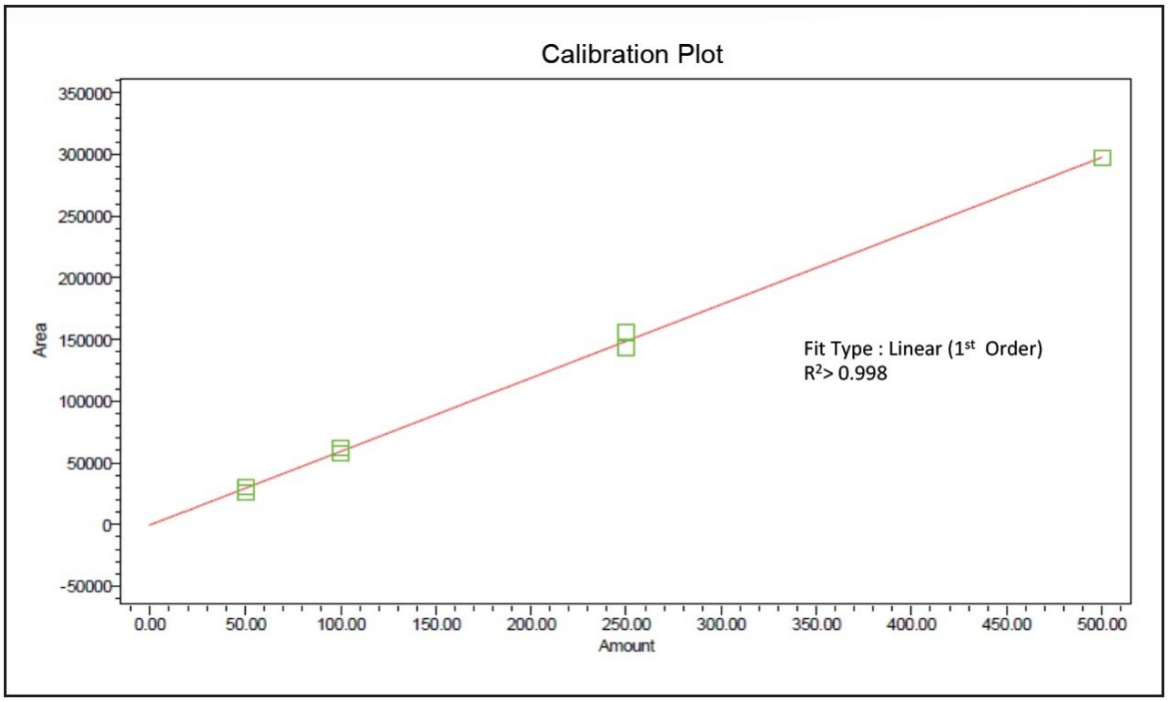

Figure 1. Sucralose duplicate calibration curve using a CORTECS C_{18} Column, 2.7 µm, 4.6 x 100 mm.

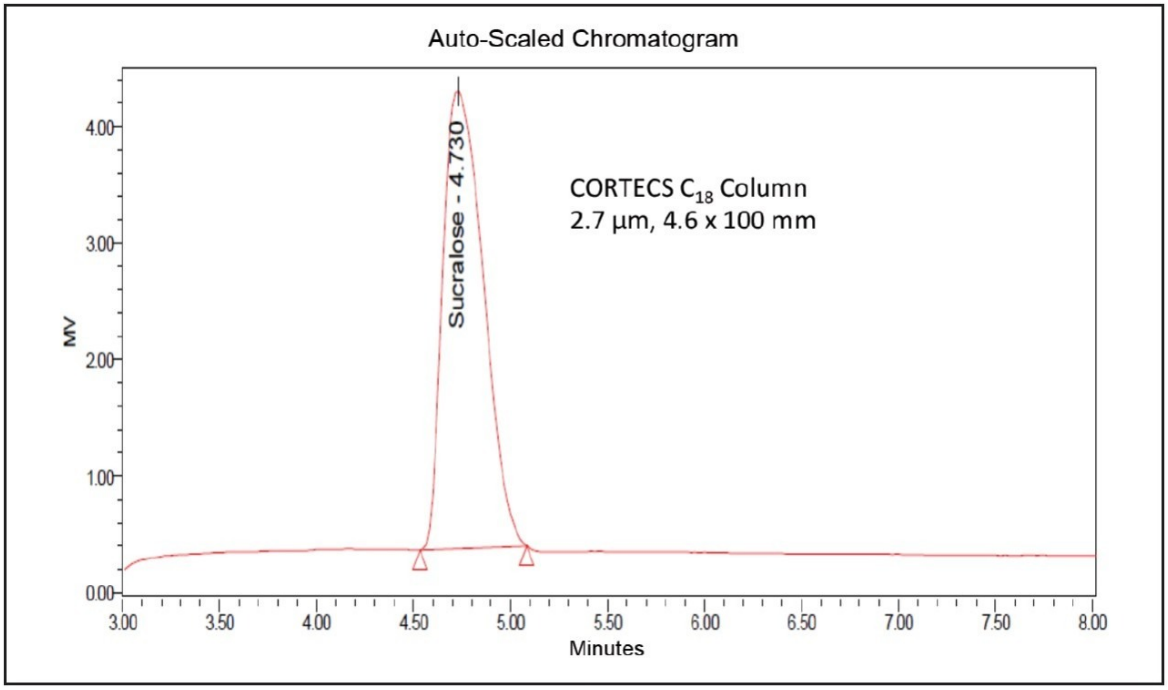

Figure 2. Sucralose 100 µg/mL standard using a CORTECS C_{18} Column, 2.7 µm, 4.6 x 100 mm.

An additional stock was also weighed and prepared using the ≥98% purity sucralose standard to create a quality control (QC) standard with a target concentration of 75 ppm. This QC standard was injected during the analytical

run and quantified against the combined calibration curves, yielding an accurate and precise value of 74.34 ppm.

Utilizing this HPLC RI method, four different flavored water samples were analyzed for sucralose content. The still water samples where directly transferred to a 2 mL vial, whereas the sparkling water samples where first degassed using ultra-sonication and then transferred to a 2 mL vial for analysis. The results of the sample analysis can be seen in Figure 3.

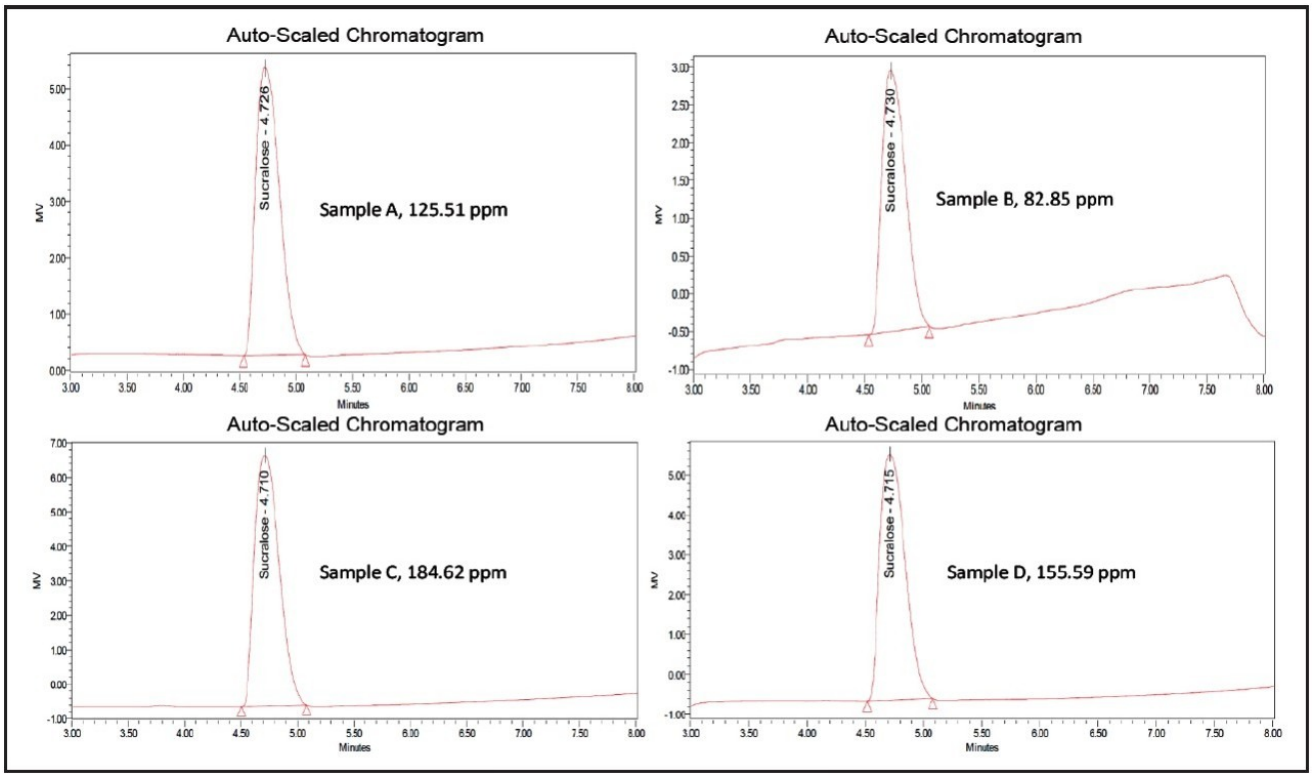

Figure 3. Sucralose quantified in various flavored water samples using a CORTECS C_{18} Column, 2.7 µm, 4.6 x 100 mm.

Conclusion

The combination of CORTECS C_{18}, 2.7 µm Chemistry, Alliance HPLC System, and refractive index detection allows for a simple isocratic method for the analysis of sucralose in flavored waters. This method showed excellent linearity and accurately quantified sucralose in several different flavored water samples.

Featured Products

- Alliance HPLC <https://www.waters.com/514248>
- 2414 Refractive Index (RI) Detector <https://www.waters.com/514425>

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