SUCRALOSE ANALYSIS USING EVAPORATIVE LIGHT SCATTERING DETECTION (ELSD)

Waters

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Introduction:

For health reasons, the use of non-nutritive sweeteners in soft drink and other products has markedly increased in the past few years. Of these, compounds such as Acesulfame and Aspartame are UV active and can easily be detected using this technique.

Another product gaining in popularity is sucralose. Derived from sucrose through the substitution of three chlorine atoms, this compound is a saccharide and thus has no significant UV activity. For this reason, we shall show the efficacy of Evaporative Light Scattering Detection (ELSD) for the analysis of this compound.

Standard Preparation:

A mixed standard was prepared by dissolving 0.107 grams of sucralose, 0.116 grams fructose, 0.131 grams glucose, and 0.128 grams sucrose in 75% acetonitrile/ water, and diluting to 100 ml with same. The sugars were reagent grade.

Sucralose was obtained from Tate and Lyle, Decatur, Illinois

A sucralose standard was prepared by dissolving 0.208 grams of sucralose in 75% acetonitrile/ water and diluting to 200 ml with same. This standard was diluted 1:2, 1:5, 1:10, 1:20, 1:50, and 1:100 with the same matrix to produce a seven point calibration curve as shown.

HPLC Conditions

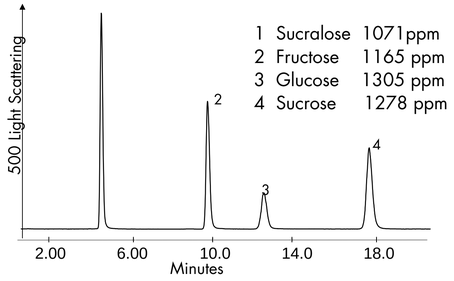
Waters Alliance™ Solvent and Sample Manager
Data System: Empower™

Eluent	75 % Acetonitrile, 25% Water
Column	YMC-Pack Polyamine II, 4.6 X 250 mm, 5 µm
Temp	35° C
Flow Rate	1.0 ml/min

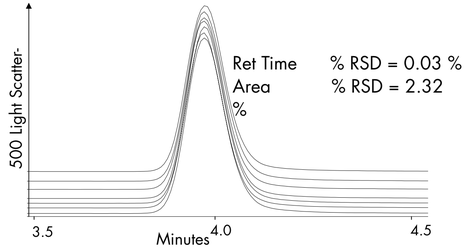
Setup for Waters 2420 ELSD Detector

Gas (N_2)	45.0 psi
Nebulizer	60%
Drift Tube Temperature	43°C
Gain Setting	10

Chromatogram of Common Sugars and Sucralose

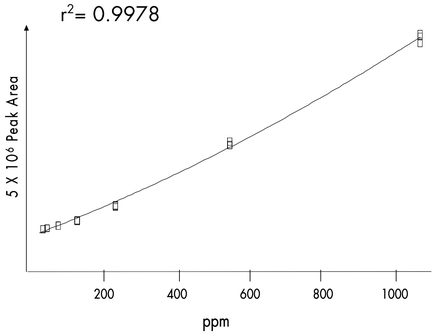


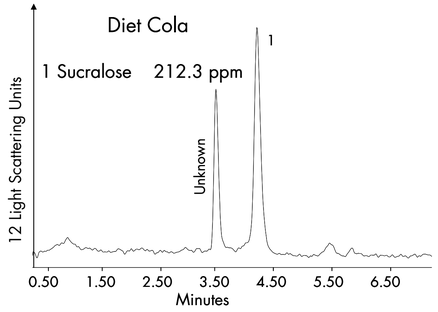
Reproducibility: 7 injections of standard 1

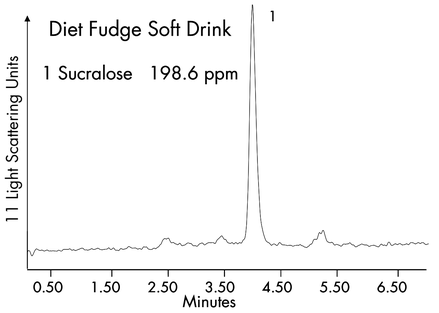


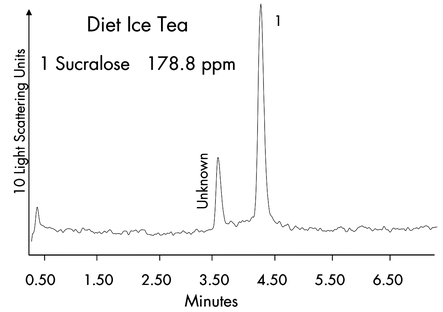
Linearity

Due to the non- linear response of ELSD data, a quadratic fit is appropriate





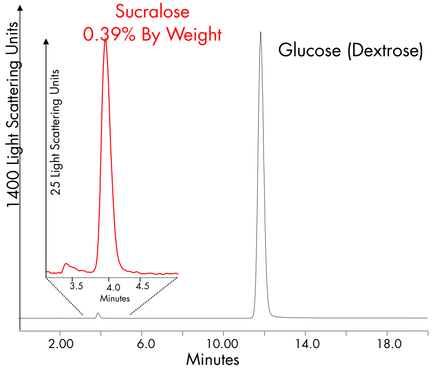




Sample Preparation:

Several commercial diet soft drinks containing sucralose were purchase at a local grocery. Where appropriate, sonnication was used to remove carbonation followed by filtration through a 0.45 micron hydrophilic filter. This was the only sample preparation necessary. One part sample and three parts acetonitrile were mixed and injected into the chromatographic system. The injection volume was 50 microliters.

A 1 gram packet of non caloric sweetener containing sucralose (actual wt 1.095 grams) was dissolved in 50 ml of 75% acetonitrile/ water and quantitated in the same way as the diet beverages with the following result.



Conclusion:

Evaporative Light Scattering can be used for the quantitation of Sucralose. Sample preparation for soft drink matrices is simple, requiring a filtration step and decarbonation where appropiate. ELSD analysis can also be used to confirm the absence of sugars in a diet preparation.

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