

## Determination of Sucralose in Soft Drinks

Sucralose is a synthetic sweetener that has approximately 600 times the sweetness of sugar, zero calories and a flavor closely resembling sugar. Over 30 countries throughout the world have approved its use. Japan also approved its use as a food additive in 1999.

In Japan, the permitted level of sucralose content in

soft drinks is 0.40g/kg, and sucralose is quantified by titration. In the U.S., sucralose is quantified by HPLC. This Application News introduces an example of analyzing sucralose contained in soft drinks using a differential refractive index detector and an evaporative light scattering detector.

### ■ Analytical Conditions

Sucralose, also known as trichlorogalactosucrose, has a structure where sucrose's three hydroxyl groups have been replaced by three chlorine atoms (Fig. 1). Sucralose is generally analyzed by the combination of reversed-phase chromatography and a refractive index detector (RID). Here, an evaporative light scattering detector (ELSD) was serially connected with an RID for data comparison. Fig. 2 shows the result of analyzing 20 $\mu$ L of sucralose standard sample (400mg/L in purified water). The analytical conditions are shown in Table 1.

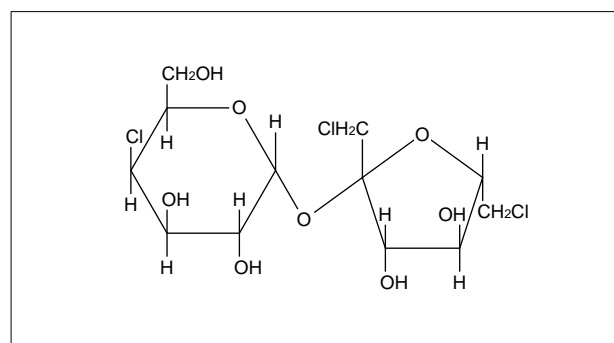


Fig.1 Structure of Sucralose

Table 1 Analytical Conditions

Column	:Shim-pack VP-ODS (150mm L.×4.6mm I.D.)
Mobile Phase	:Water / Acetonitrile = 85 / 15 (v/v)
Flow Rate	:1.0mL/min
Temperature	:40°C
Detection	:RID-10A
	ELSD-LT
	Temperature : 35°C
	Gain : 7
	Nebulize Gas: N <sub>2</sub>
	Gas Pressure : 350kPa
Injection Volume	:20 $\mu$ L

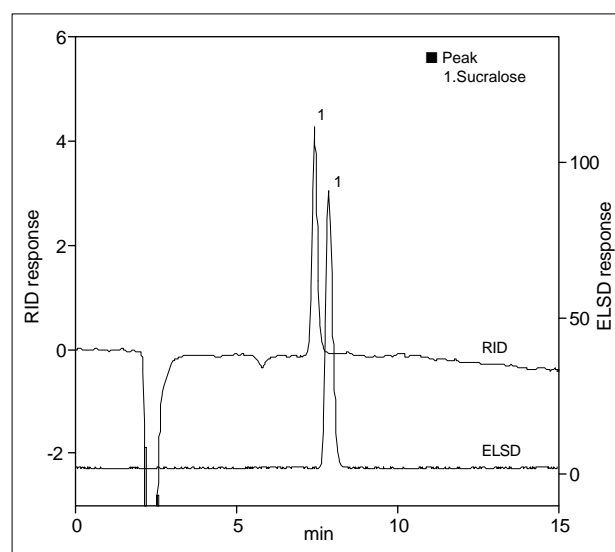


Fig.2 Chromatogram of Standard Sucralose (400mg/L)

### ■ Sensitivity

Fig. 3 shows the chromatograms obtained by RID and ELSD when injecting 20 $\mu$ L of standard sucralose sample (40mg/L). The analytical conditions are the same as in Table 1. A more stable baseline is obtained with ELSD. However, ELSD's detection response is not proportional to concentration. Therefore, the calibration curve must be plotted using double logarithmic coordinates.

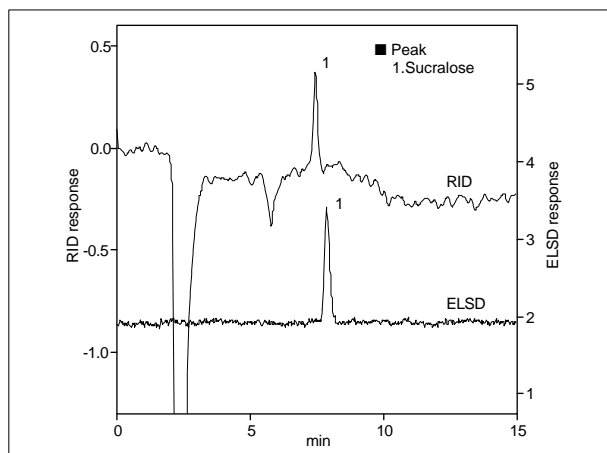


Fig.3 Chromatogram of Standard Sucralose (40mg/L)

### ■ Analysis of Soft Drinks

Two soft drinks A and B, and canned coffee were analyzed. The analytical conditions are the same as in Table 1. Beverage B and the canned coffee did not contain sucralose, so they were spiked in advance with sucralose to obtain a concentration of 400mg/L. Soft drinks A and B were filtered through a membrane filter before injection. For the canned coffee, the injection sample was obtained by centrifugal separation (12,000rpm  $\times$  15min) using an ultrafiltration membrane (M.W. 10,000).

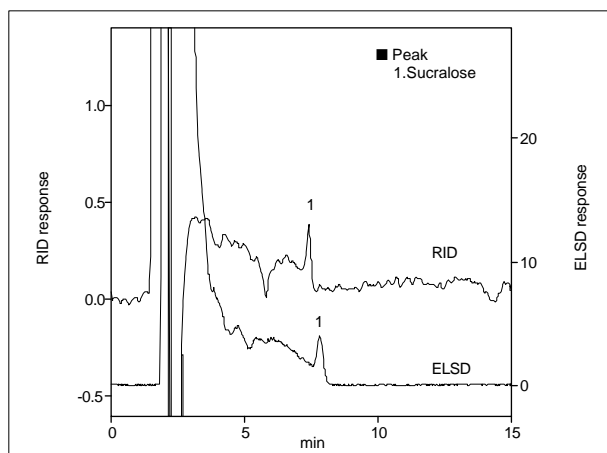


Fig.4 Chromatogram of Soft Drink A

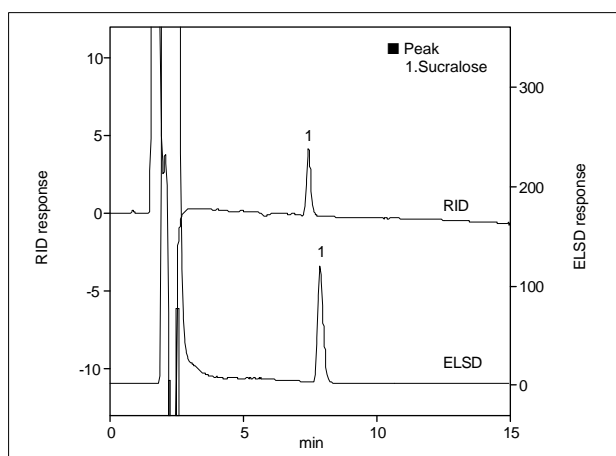


Fig.5 Chromatogram of Soft Drink B (spiked 400mg/L)

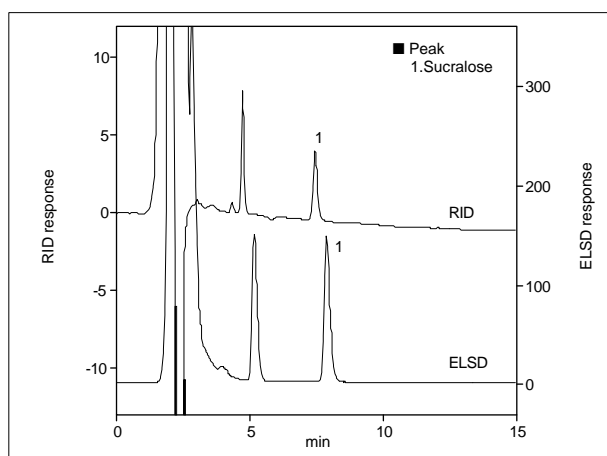


Fig.6 Chromatogram of Canned Coffee Drink (spiked 400mg/L)

### Bibliography:

- 1) Food Sanitation Compact Dictionary (2002 Edition, Japan)
- 2) Food Chemicals Codex Fourth Edition



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