

Analysis of Sorbitol in Apples on the Hitachi LaChrom Elite® Liquid Chromatography System Using Refractive Index Detection

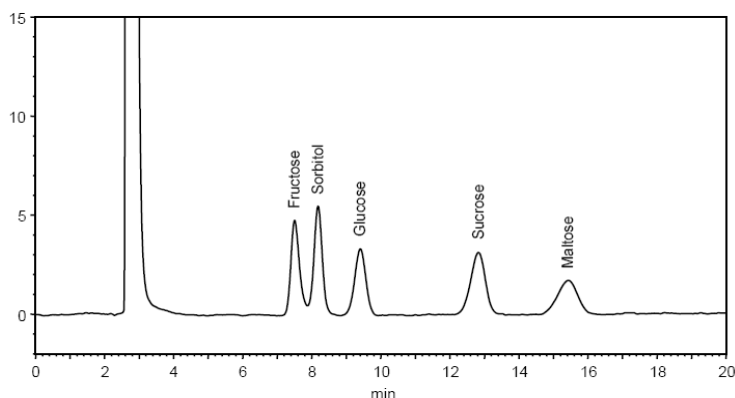
Hitachi High Technologies America, Inc.

Sorbitol is a sugar alcohol obtained by the reduction of glucose and is often utilized in the food industry as a sugar-free sweetener. It causes an endothermic reaction when it dissolves in water, and thus it is also added to candies and snacks for the cooling sensation it provides. Apples are a common, natural source of Sorbitol. In this study, sorbitol and the sugars in apples – glucose, fructose and sucrose – were analyzed using the Hitachi LaChrom Elite® liquid chromatography system. Maltose was also included in the standard mixture due to its presence in several other fruits. Since these analytes lack chromophores and fluorophores, differential refractive index detection was utilized.

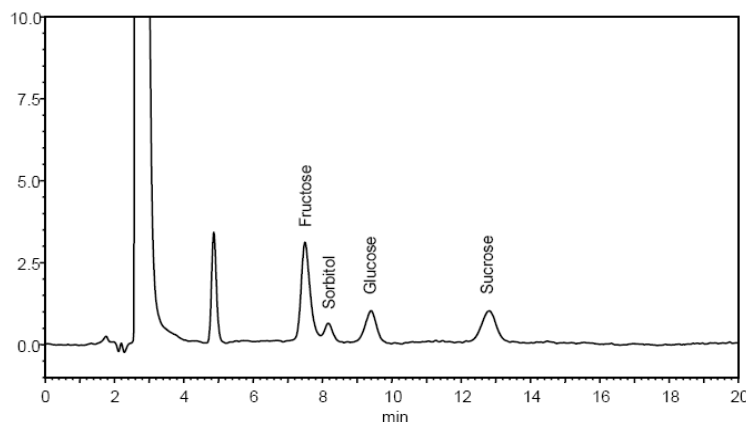
Experimental Conditions

Module	Conditions
Pump (L-2130)	Mobile Phase: ACN/H ₂ O (75/25) isocratic Flow Rate: 1mL/min
Autosampler (L-2200)	Injection Volume: 10µL
Oven (L-2350)	Temperature: 30°C
Detector (L-2490)	Refractive Index Detection
Column	Asahipak® NH2P-50 4E, Amino 5µm, 4.6x250mm
Standard	1000µg/mL of each component in mobile phase

Results – Chromatogram of Standards



Results – Chromatogram of Apple Extract



Results – Linearity Studies

Peak #	Name	Concentration Range (ug/mL)	R ²
1	Fructose	100-2000	0.9993
2	Sorbitol	100-1000	0.9998
3	Glucose	100-2000	0.9995
4	Sucrose	100-2000	0.9990
5	Maltose	100-2000	0.9996

* n=4 for all components except sorbitol (n=3)

Discussion

Hitachi's LaChrom Elite® liquid chromatography system, equipped with refractive index detection, is effective at analyzing sorbitol and the sugars contained in apples. The system exhibits a linear response over a broad concentration range, and it can be used to analyze sorbitol and natural sugars contained in other fruits as well.

Reference:

1 – Technical Data Sheet LC090031, Hitachi High Technologies Corporation.

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