



Analysis of sugars in foods and beverages by HPLC with pulsed amperometric detector

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Food

Abstract

Sugars are generally analyzed by HPLC with refractive index detection. UV or fluorescence detection are also frequently used, coupled with pre or post derivatization for high sensitive analysis. However, the methods mentioned above have some limitations, such as the difficulty of simultaneously analyzing various sugars, or the tedious procedure of derivatization. The pulsed amperometric detector (PAD) is a common method for sugar analysis. The coupling of the PAD and post-column pH-changing offers a simple, easy and highly sensitive way of detecting sugars.

This brief demonstrates the analysis of various sugars in candy and juice using PAD with post-column pH-changing. The sugars are separated by both ligand exchange and size exclusion mode.

Analyzed Compounds

Sucrose, glucose, galactose, mannose, fructose, mannitol, and sorbitol.

Sample

Candy and apple juice.

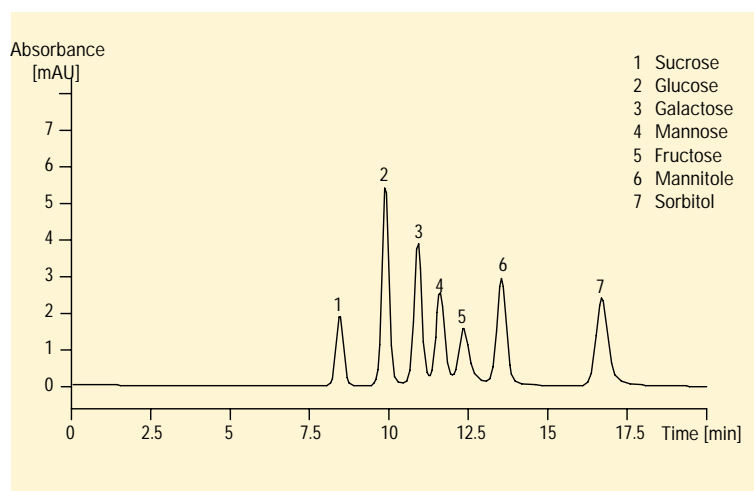


Figure 1
Chromatogram of standard solution, 50 mg/l each

Conditions

Column 300 x 7.8 mm Excerptak CHA-L31
(This column is same as SPELCOGEL C-611)

Mobile phase

0.1 mM NaOH, 0.75 ml/min

Post column reagent

400 mM NaOH, 0.6 ml/min

Column temp 80 °C

Injection vol 20 µl

Detector

Agilent 1049 Electrochemical detector
Mode; Pulse mode

Working electrode; gold

Applied Potential; Pot1 = 0.65 V,
Pot2 = -0.95 V, Pot3 = 0.15 V

Sample preparation

Candy was dissolved in water and
filtrated Juice was diluted and filtrated.



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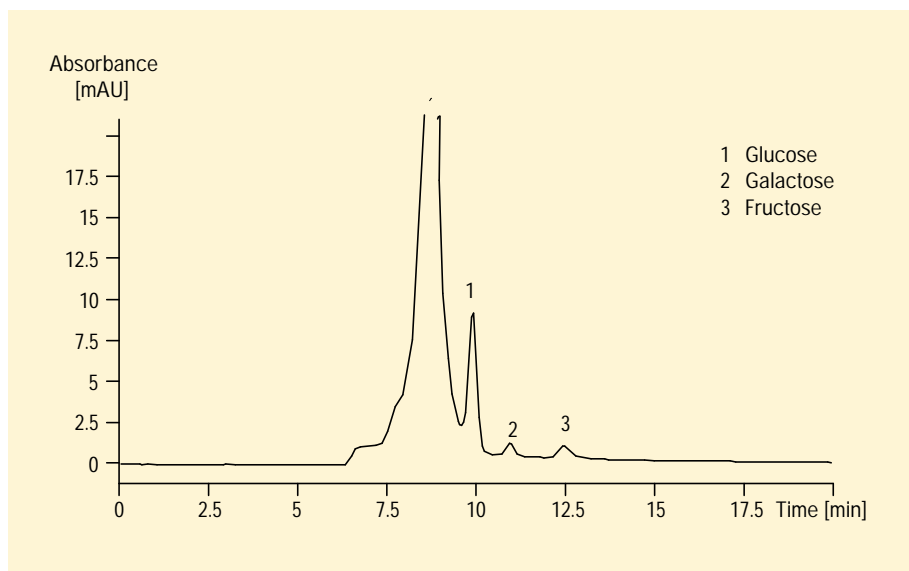


Figure 2
Chromatogram of sugars in candy

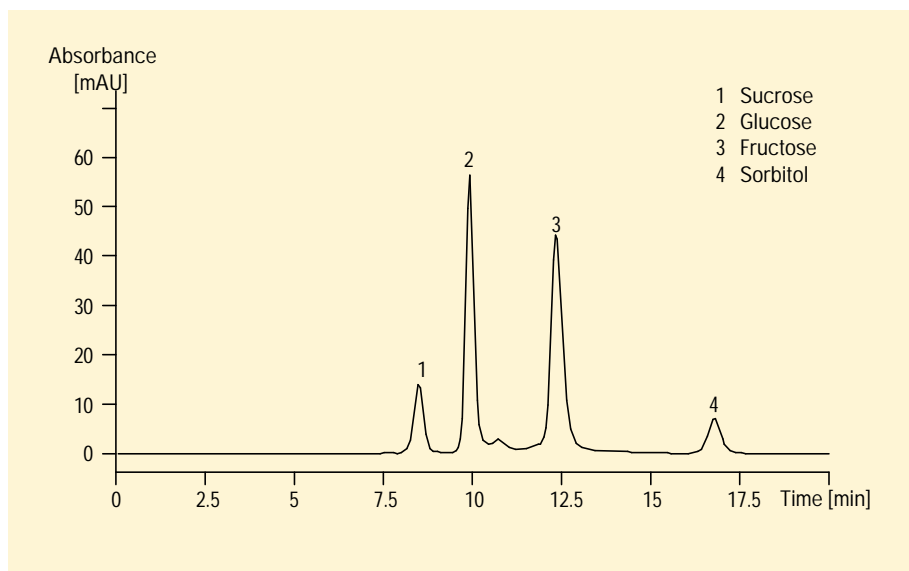
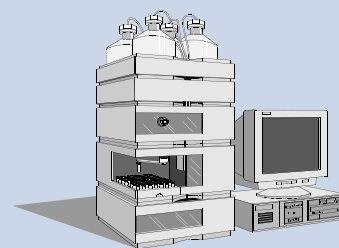


Figure 3
Chromatogram of sugars in apple juice

Equipment

Agilent 1100 Series

- 2 isocratic pumps with
 - vacuum degasser
 - autosampler
 - thermostatted column compartment
 - programmable electrochemical detector
- Agilent ChemStation + software



Method Performance

Limit of detection
0.23~0.95 mg/L (S/N = 3)
RSD of peak area 1.0~4.0 %
RSD of retention time
0.1~0.2 %

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