

Determination of High Sugar Concentrations in a Balsamic Vinegar Sample Using a Compact Ion Chromatography System

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Key Words

HPAE-PAD, Dionex Integrion RFIC System, Dionex CarboPac PA20 Column, Dionex EGC 500 KOH Eluent Generator

Introduction

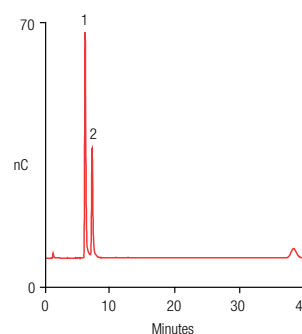
This application proof note demonstrates the determinations of glucose and fructose in a 100-fold diluted balsamic vinegar sample by HPAE-PAD. Typically, samples with g/L concentrations require greater than 10,000-fold dilutions to remain in the linear range of the very sensitive HPAE-PAD technique. However, in this proof note, the method is performed using a Thermo Scientific™ Dionex™ Integrion™ RFIC™ system equipped with a 0.4 µL internal injection loop and the Thermo Scientific™ High Concentration Carbohydrate Analysis Kit¹ to extend the linearity from low mg/L to g/L concentrations. A wood hydrolysate application using this technique is available for reference.²

Method

IC System:	Thermo Scientific Dionex Integrion RFIC system with column heater
Columns:	Thermo Scientific™ Dionex™ CarboPac™ PA20 Analytical (3 × 150 mm) Thermo Scientific Dionex CarboPac PA20 Guard (3 × 30 mm)
Eluent:	35 mM KOH with 100 mM KOH wash
Flow Rate:	0.50 mL/min
Injection Volume:	0.4 µL
Temperature:	30 °C
Detection:	Pulsed amperometry, disposable Au on PTFE working electrode, 62 mil gasket

Reference

1. Thermo Scientific Product Specification 70749: Thermo Scientific High Concentration Carbohydrate Analysis Kit. Sunnyvale, CA [Online] <https://www.thermoscientific.com/content/dam/tfs/ATG/CMD/CMD%20Documents/Product%20Manuals%20&%20Specifications/PS-70749-High-Concentration-Carbohydrate-Analysis-Kit-PS70749-EN.pdf> (accessed Jan. 8, 2016)
2. Thermo Scientific Application Note 1089: Determination of Carbohydrates in Acid Hydrolysates of Wood. Sunnyvale, CA [Online] <http://www.thermoscientific.com/content/dam/tfs/ATG/CMD/CMD%20Documents/Application%20&%20Technical%20Notes/Chromatography/Ion%20Chromatography/AN-1089-Carbohydrates-Acid-Hydrolysates-Wood-AN70941-EN.pdf> (accessed Jan. 8, 2016)



Column: Dionex CarboPac PA20 guard,
Dionex CarboPac PA20, 3 mm i.d.
Eluent: 35 mM KOH, 100 mM KOH wash
from 15 to 25 min
Eluent Source: Dionex EGC 500 KOH cartridge,
Dionex CR-ATC 600 trap column,
high pressure degasser
Flow Rate: 0.50 mL/min
Inj. Volume: 0.4 µL
Column Temp.: 30 °C
Detection: PAD, Au on PTFE, 62 mil gasket
Waveform: 4-Potential Carbohydrate
Ref. Electrode: Ag/AgCl
Sample Prep.: 100x dilution with deionized water

Peaks: 1. Glucose 1.18 g/L
2. Fructose 0.73

Figure 1. Glucose and fructose in a balsamic vinegar sample.

For application support, visit the [AppsLab Library](#) where you can find detailed method information, chromatograms and related compound information. All the information needed to run, process and report the analysis is available in ready-to-use eWorkflows, which can be executed directly in your chromatography data system. www.thermoscientific.com/appslib



www.thermoscientific.com/integrion

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