Determination of High Sugar Concentrations in a Sparkling Wine Sample Using a Compact Ion Chromatography System

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Key Words

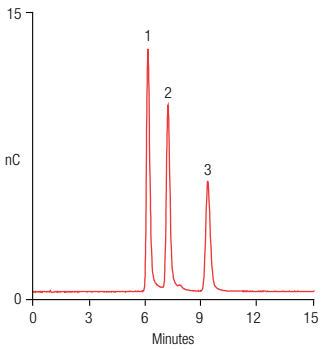
RFIC, HPAE-PAD, Dionex Integrion RFIC System, Dionex CarboPac PA20 Column, Dionex EGC 500 KOH Eluent Generator, Alcohol

Introduction

This application proof note demonstrates the determinations of glucose, fructose, and sucrose in a 100-fold diluted sparkling wine 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 eqipped with a 0.4 µL internal injection loop and the Thermo Scientific™ High Concentration Carbohydrate Analysis Kit[1] 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 amperometric, disposable Au on PTFE working, 62 mil gasket



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 500 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:	Sparkling wine, Brand C
Sample Prep.:	100x dilution with deionized water
Peaks:	1. Glucose 232 mg/L 2. Fructose 230 3. Sucrose 230

Figure 1. Separation of sugars in a sparkling wine sample.

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 Documents/Product Manuals & Specifications/PS-70749-High-Concentration-Carbohydrate-Analysis-Kit-PS70749-EN.pdf (accessed Jan. 14, 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 Documents/Application & Technical Notes/Chromatography/Ion Chromatography/AN-1089-Carbohydrates-Acid-Hydrolysates-Wood-AN70941-EN.pdf (accessed Jan. 14, 2016)

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/appslab

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