Determination of Ammonia in Sodium Bicarbonate Using a Compact Ion Chromatography System

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Key Words

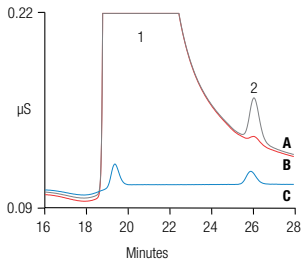
Integrion, IonPac CS16, EGC 500, Suppressed Conductivity, Hemodialysis Solution, Ion Chromatography

Introduction

One of the main pharmaceutical uses of sodium bicarbonate is for hemodialysis, and the quality and purity requirements for hemodialysis-grade sodium bicarbonate are stringent. Ammonia is one impurity that is assayed in sodium bicarbonate because the presence of elevated levels of ammonia in the blood stream can have adverse effects. This application proof note demonstrates the determination of ammonia (as ammonium) in sodium bicarbonate, using the method published in Application Note 1073.[1] In this proof note, the method is performed using a Thermo Scientific™ Dionex™ Integrion™ ion chromatography system.

Method

IC System:	Thermo Scientific Dionex Integrion IC system		
Columns:	Thermo Scientific Dionex IonPac CS16 Analytical (3 × 250 mm) Thermo Scientific Dionex IonPac CG16 Guard (3 × 50 mm)		
Eluent:	Methanesulfonic acid		
Gradient:	**Retention Time [min]**	**Flow [mL/min]**	**Concentration [mM]**
	0.0	0.43	7.0
	26.0	0.43	7.0
	26.1	0.43	70.0
	34.0	0.43	70.0
	34.1	0.43	7.0
	40.0	0.43	7.0
Flow Rate:	0.43 mL/min		
Injection Volume:	25 µL		
Temperature:	40 °C		
Detection:	Suppressed conductivity, Thermo Scientific™ Dionex™ CERS™ 500 (2 mm) Electrolytically Regenerated Suppressor		



Columns: Dionex IonPac CS16 set, 3 mm i.d.
MSA Gradient: 7 mM (0–26 min); 70 mM (26.1–34 min), 7 mM (34.1–40 min)
Eluent Source: Dionex EGC 500 cartridge, CR-ATC 600 trap, high pressure degasser
Flow Rate: 0.43 mL/min
Injection Vol.: 25 µL
Column Temp.: 40 °C
Detection: Suppressed conductivity, Dionex CERS 500, 2 mm, 36 mA recycle mode
Samples: A. Sodium bicarbonate (1 mg/mL) spiked with 0.02 mg/L ammonium
B. Sodium bicarbonate (1 mg/mL) not spiked
C. DI water
Peaks: 1. Sodium
2. Ammonium

Figure 1. Determination of ammonia in sodium bicarbonate.

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

Reference

1. Thermo Scientific Application Note 1073: Determination of Ammonia in Sodium Bicarbonate. Sunnyvale, CA [Online] http://www.thermoscientific.com/content/dam/tfs/ATG/CMD/CMD%20Documents/AN-1073-Determination-Ammonia-Sodium-Bicarbonate-AN70815-E.pdf (accessed Jan. 8, 2016)

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