IC Assay for Lithium, Sodium, and Calcium in Lithium Carbonate Using a Compact Ion Chromatography System

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Key Words

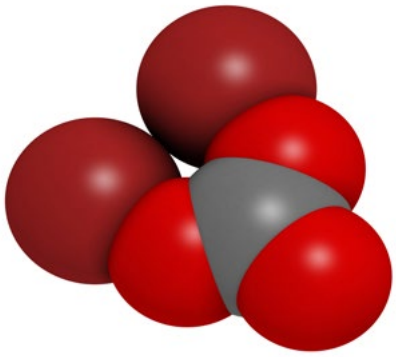
Integrion, IonPac CS16, EGC 500, Cationic Impurities

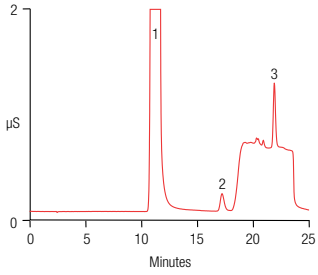
Introduction

Lithium carbonate is used to treat a number of mental health problems associated with chemical imbalances in the brain. Sodium and calcium are possible cationic impurities in lithium carbonate preparations. This application proof note shows the determination of lithium, sodium, and calcium in lithium carbonate, using the method published in Application Note 1090.[1] In this proof note, the method is performed using a Thermo Scientific™ Dionex™ Integrion™ ion chromatography system in combination with a Thermo Scientific™ Dionex™ IonPac™ CS16 cation-exchange column, an electrolytically generated MSA eluent, and suppressed conductivity detection.

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	8.0
	15.0	0.43	8.0
	15.0	0.43	67.0
	20.0	0.43	67.0
	20.0	0.43	8.0
	25.0	0.43	8.0
Flow Rate:	0.43 mL/minn		
Injection Volume:	10 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: 8 mM (0–15 min); 67 mM (15–20 min), 8 mM (20–25 min)
Eluent Source: Dionex EGC 500 cartridge, CR-ATC 600 trap, high pressure degasser
Flow Rate: 0.43 mL/min
Injection Vol.: 10 µL
Column Temp.: 40 °C
Detection: Suppressed conductivity, Dionex CERS 500, 2 mm, 85 mA recycle mode

Peaks:		
1. Lithium	50	mg/L
2. Sodium	0.26	
3. Calcium	0.40	

Figure 1. Lithium, sodium, and calcium in lithium carbonate.

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 1090: IC Assay for Lithium, Sodium, and Calcium in Lithium Carbonate. Sunnyvale, CA [Online] http://www.thermoscientific.com/content/dam/tfs/ATG/CMD/CMD%20Documents/Application%20&%20Technical%20Notes/Chromatography/Ion%20Chromatography/AN-1090-IC-Lithium-Sodium-Calcium-Lithium-Carbonate-AN71001-EN.pdf (accessed Jan. 8, 2016)

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