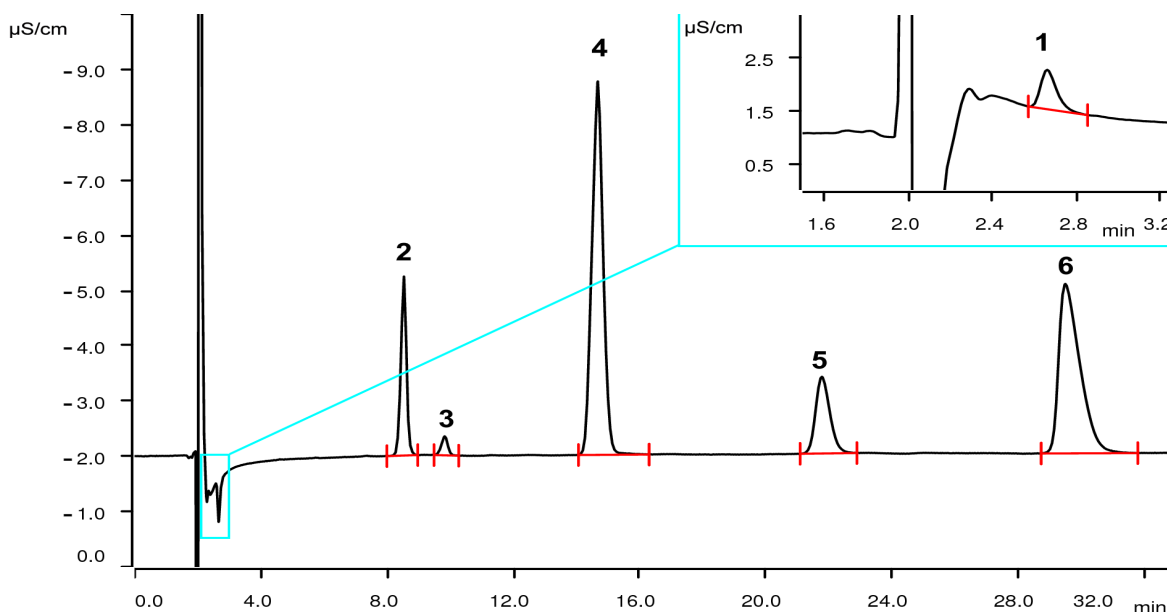


Cations and lactic acid in whey powder applying two separation mechanisms in the same analysis



Whey is the remaining liquid after cheese production. It is mainly used as feed. It is also used as dietary supplement as a beverage or in powder form. This application determines lactic acid as well as cations in one determination. The Metrosep C 6 - 250/4.0 column separates sodium, potassium, magnesium, and calcium by ion exchange. It also acts as an ion-exclusion column, which separates lactic acid. Both lactic acid and the cations can be determined in the same run applying direct conductivity detection. While cations typically elute as negative peaks, lactic acid elutes as an early positive peak. MagIC Net shows both in the usual positive direction.

Results

Analytes	Conc. [mg/kg]	Recov. [%]	Analytes	Conc. [mg/kg]	Recov. [%]
1 Lactic acid	1902	98	5 Magnesium	173	99
2 Sodium	248	97	6 Calcium	921	98
4 Potassium	2248	99			

Peak 3 unknown

Sample

Whey powder

Sample preparation

5 g of sample is dissolved in 500 mL eluent. Protein precipitation by heating to 50 °C for 5 min. Injection after filtration (0.2 µm).

Columns

Metrosep C 6 - 250/4.0	6.1051.430
Metrosep C 4 Guard/4.0	6.1050.500

Solutions

Eluent	4.0 mmol/L nitric acid
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Instrumentation

ECO IC	2.925.0020
IC Conductivity Detector	2.850.0010
863 Compact IC Autosampler	2.863.0010

Analysis

Direct conductivity detection	
Background conductivity	1279 µS/cm

Separation mechanism

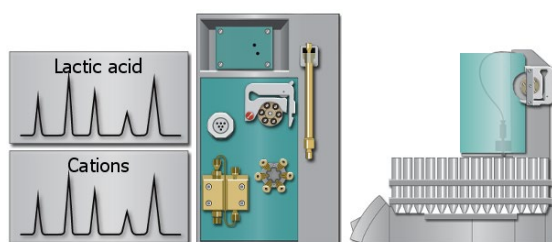
Cation exchange	Na, K, Mg, Ca
Ion exclusion	Lactic acid

Data acquisition

Cation exchange:	
Polarity	Negative
Recording time	0...33 min
Ion exclusion:	
Polarity	Positive
Recording time	0...5 min

Parameters

Flow rate	0.9 mL/min
Injection volume	20 µL
P _{max}	25 MPa
Total recording time	33 min
Column temperature	Ambient



Remarks

To proof the lactic acid result, the same sample was analyzed on a Metrosep Organic Acids - 250/7.8 applying suppressed conductivity detection. The results are fully comparable.