



DETERMINATION OF INORGANIC CATIONS IN WATER SAMPLES

Lumex Method M 01-31 (2011)

INTRODUCTION

The method allows determination of ammonium, lithium, sodium, potassium, magnesium, calcium, strontium and barium cations in samples of **natural**, **potable**, and **waste water** by the capillary electrophoresis method.

MEASUREMENT METHOD

The capillary electrophoresis method for evaluation of cations concentration is based on differential migration and separation of cations in electric field due to the difference in their electrophoretic mobility. Identification and quantitative determination of the analyzed cations is performed by indirect detection measuring UV absorption at 254 or 267 nm wavelength.

MEASUREMENT RANGE

Measurement ranges of inorganic cations are listed below.

Cations	Measurement ranges*, mg/L	Cations	Measurement ranges*, mg/L
Ammonium	0.5–5000	Magnesium	0.25–2500
Barium	0.1–10	Potassium	0.5–5000
Calcium	0.5–5000	Sodium	0.5–5000
Lithium	0.015–2	Strontium	0.25–50

Injection of samples with sodium concentrations above 200 mg/L results in distortion of ammonium and potassium peaks' shapes, which, however, does not influence quantitative evaluation of their concentrations.

EQUIPMENT AND REAGENTS

The CAPEL[®] capillary electrophoresis system is used in measurements. Data acquisition, collection, processing and output are performed using a personal computer running under WINDOWS[®] XP/7/8 operating system with installed dedicated software package ELFORUN[®]. All reagents must be of analytical grade or better.

EXAMPLE OF A REAL ANALYSIS

BGE: BIA, with tartaric acid and 18-crown-6

Capillary: $L_{\text{eff}}/L_{\text{tot}}$ 50/60 cm, ID 75 μm

Injection: 150 mbar x sec

Voltage: + 25 kV

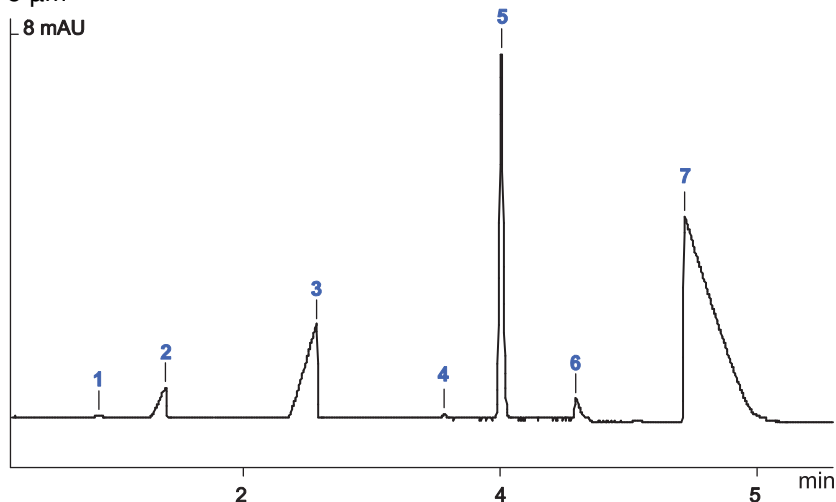
Temperature: RT

Detection: 267 nm, indirect

Sample: natural water

Measurement results:

- 1 – ammonium (0.4 mg/L)
- 2 – potassium (12.7 mg/L)
- 3 – sodium (28 mg/L)
- 4 – lithium (0.1 mg/L)
- 5 – magnesium (13.7 mg/L)
- 6 – strontium (3.5 mg/L)
- 7 – calcium (93 mg/L)



The information in this leaflet is supplemental. To get more specific, please contact the manufacturer of CAPEL[®] CE systems LUMEX INSTRUMENTS Group.

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