Capel

High performance capillary electrophoresis system

Determination of **cations and anions** in highly saline water and process aqueous solutions



INTRODUCTION

Capillary electrophoresis method is used for the determination of basic components in the following types of water:

- surface and ground waters for any water use purposes, including field development (sea, formation, produced, and process waters, mine brines, etc.);
- water with different level of mineralization, from freshwater (<0.5 g/L) to brines (>350 g/L);
- process aqueous solutions with different level of mineralization.

MEASUREMENT METHOD

The measurement method is based on the sample dilution with distilled water, futher separation and quantitative determination of components by capillary electrophoresis.

MEASUREMENT RANGE

Component	Measurement range, mg/L	Lumex Instruments set, order No.
Ammonium	5–5000	0300001763
Potassium	5–150 000	
Sodium	5–150 000	
Lithium	1–1500	
Magnesium	2,5–70 000	
Strontium	2,5–10 000	
Barium	2–10 000	
Calcium	5–200 000	
Chloride	5–450 000	0300001754
Sulfate	5–25 000	
Bromide	0.5–20 000	0300001781

EQUIPMENT AND REAGENTS

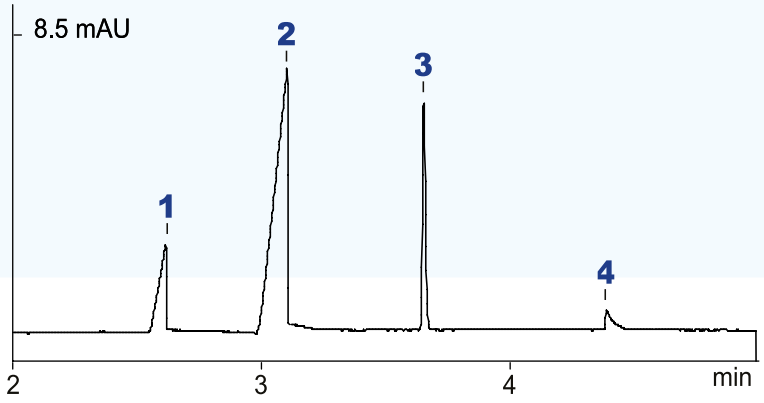
The Capel capillary electrophoresis system is used in measurements. Data acquisition, collection, processing, and output are performed using a personal computer running under Windows® operating system with Elforun software installed.

EXAMPLE OF A REAL ANALYSIS

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

Sample: mine brine
(dilution factor – 2000)

Found (mg/L):
1 – potassium (2350)
2 – sodium (27 400)
3 – magnesium (24 200)
4 – calcium (60 200)

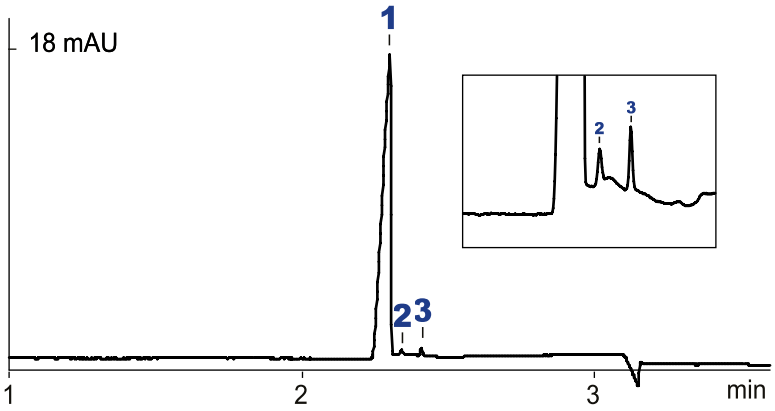


BGE: chromate, with diethanolamine and CTA-OH

Sample: mine brine
(dilution factor – 2000)

Found (mg/L):
1 – chloride (259 000)
2 – bromide (1620)
3 – sulfate (2150)

At high concentrations, bromides can be determined simultaneously with chlorides and sulfates.



BGE: sulfate, with CTA-OH

Sample: brine
(dilution factor – 50)

Found (mg/L):
1 – chloride (4300)
2 – bromide (2.7)

Chlorides with mass concentration ratio of 4000:1 do not interfere determination of bromides.

