



## DETERMINATION OF INORGANIC ANIONS IN WATER SAMPLES

LUMEX Method M 01-30 (2009)

### INTRODUCTION

The method allows determination of inorganic anions (chloride, nitrite, sulfate, nitrate, fluoride, and phosphate as soluble *ortho*-phosphate) in samples of natural, potable and cleaned waste water.

### MEASUREMENT METHOD

The capillary electrophoresis method for determination of inorganic anions' concentrations is based on differential migration and separation of anions in the electric field due to different electrophoretic mobility. Identification and quantitative determination of the analyzed anions is performed by indirect detection by measuring the UV absorption at 254 nm (for "CAPEL®-103RT/104T" systems) or 374 nm (for "CAPEL®-105/105M" systems) wavelength.

### MEASUREMENT RANGE

Anions	Samples	Measurement range, mg/L
Chloride	Potable, natural and cleaned waste water	0.5–20000
Fluoride		0.1–25
Nitrate		0.2–100
Nitrite		0.2–100
Phosphate		0.25–50
Sulfate		0.5–20000

Soluble carbonates with concentration ratio 1000:1 do not influence determination of phosphates and other anions. Monobasic organic acids and neutral organic compounds do not influence the determination of analyzed anions. Polyphosphates are not determined in the scope of this method.

### EQUIPMENT AND REAGENTS

The "CAPEL®" capillary electrophoresis system with high-voltage negative polarity is used in measurements. Data acquisition, collection, processing and output are performed using a personal computer running under "WINDOWS® 2000/XP" operating system with installed dedicated software package for acquisition and processing of chromatography data.

All reagents must be of analytical grade or better.

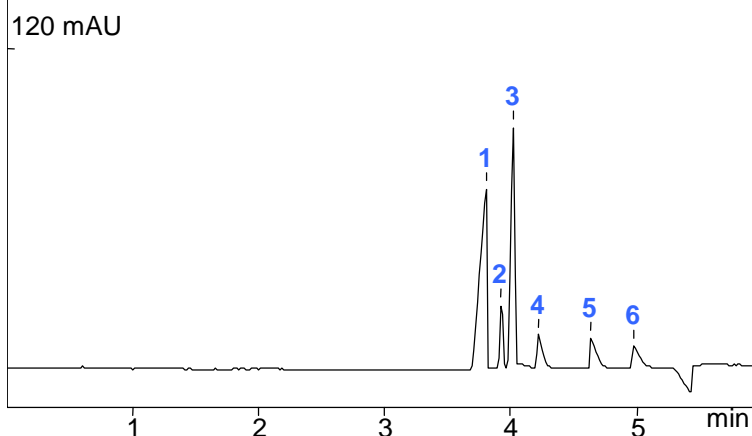
### EXAMPLE OF A REAL ANALYSIS

**Buffer:** chromate, with DEA and CTA-OH  
**Capillary:**  $L_{EFF}/L_{TOTAL}$  50/60 cm, ID 75  $\mu$ m  
**Injection:** 300 mbar x sec  
**Voltage:** – 17 kV  
**Detection:** 254 nm, indirect

**Sample:** calibration solution

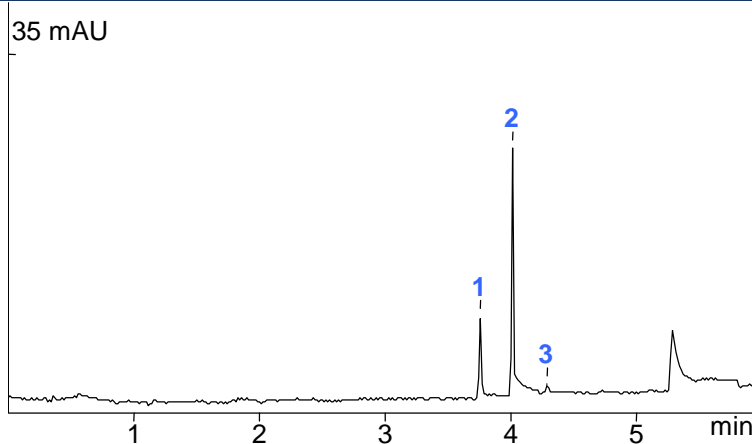
**Measurement results:**

- 1 – chloride (200 mg/L)
- 2 – nitrite (50 mg/L)
- 3 – sulfate (200 mg/L)
- 4 – nitrate (59 mg/L)
- 5 – fluoride (10 mg/L)
- 6 – phosphate (25 mg/L)

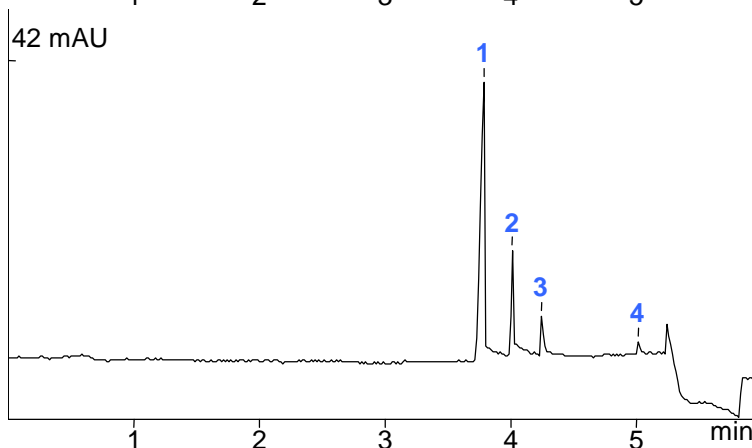




**Sample:** tap water  
**Measurement results:**  
1 – chloride (9.1 mg/L)  
2 – sulfate (26 mg/L)  
3 – nitrate (1.1 mg/L)



**Sample:** waste water (dilution 1:9)  
**Measurement results:**  
1 – chloride (566 mg/L)  
2 – sulfate (178 mg/L)  
3 – nitrate (120 mg/L)  
4 – phosphate (22.6 mg/L)



The contents on this paper are subject to change without notice.