



DETERMINATION OF WATER-SOLUBLE FORMS OF INORGANIC AND ORGANIC ANIONS IN SOILS, CLAYS, PEATS, WASTEWATER SILTS, ACTIVATED SLUDGES, AND BOTTOM SEDIMENTS

Lumex Method M 03-06 (2010)

INTRODUCTION

The method allows determination of water-soluble forms of inorganic (chlorides, sulfates, nitrates, fluorides, and phosphates) and organic (acetates, formates, and oxalates) anions in **soils**, **clays**, **peats**, **wastewater silts**, **activated sludges**, and **bottom sediments** by capillary electrophoresis method.

MEASUREMENT METHOD

The measurement method is based on the extraction of water-soluble forms of inorganic anions by distilled water from a soil sample to the 1:5 ratio and subsequent separation, identification, and determination of analyzed components by the capillary electrophoresis method with indirect anion detection at wavelengths of 254 nm or 374 nm.

MEASUREMENT RANGE

The measurable anion weight fraction ranges are listed below.

Anions	Measurement ranges*, mg/kg	Anions	Measurement ranges*, mg/kg
Acetate	3.0–1000	Formate	1.0–500
Nitrate	3.0–10000	Phosphate	3.0–5000
Oxalate	3.0–100	Fluoride	1.0–100
Sulfate	3.0–20000	Chloride	3.0–20000

* – For the sample/distilled water weight ratio 1:5.

Other inorganic and organic anions do not interfere with determination of the analyzed anions.

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.

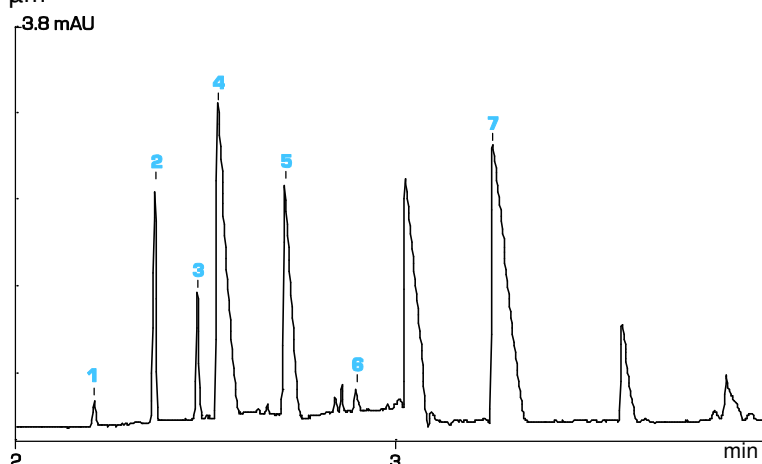
EXAMPLE OF A REAL ANALYSIS

BGE: chromate, with DEA and CTA-OH
Capillary: $L_{\text{eff}}/L_{\text{tot}}$ 50/60 cm, ID 75 μm
Injection: 150 mbar x sec
Voltage: – 25 kV
Temperature: RT
Detection: 374 nm, indirect

Sample: water extract of a typical chernozem soil

Measurement results:

- 1 – chloride (5.6 mg/kg)
- 2 – sulfate (58 mg/kg)
- 3 – oxalate (26 mg/kg)
- 4 – nitrate (423 mg/kg)
- 5 – formate (106 mg/kg)
- 6 – phosphate (4.6 mg/kg)
- 7 – acetate (299 mg/kg)



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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