



Determination of water-soluble forms of **inorganic** and **organic anions** in soils

INTRODUCTION

The method allows determination of water-soluble forms of inorganic (chloride, sulfate, nitrate, fluoride, and phosphates) and organic (acetate, formate, and oxalate) 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 anions by distilled water from a soil sample and subsequent separation, identification, and determination of analyzed components by the capillary electrophoresis method with indirect anion detection at wavelengths of 254 nm.

MEASUREMENT RANGE

The measurement ranges for the components are presented in the table below.

Anions	Measurement range, mg/kg*	Anions	Measurement range, mg/kg*
Chloride	3–20 000	Fluoride	1–100
Sulfate	3–20 000	Formate	1–500
Oxalate	3–100	Phosphate	3–5000
Nitrate	3–10 000	Acetate	3–1000

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

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.

Lumex Instruments set, order **No. 0300001824**.

EXAMPLES OF REAL ANALYSES

BGE: chromate, with DEA and CTA-OH

Capillary: L_{eff}/L_{tot} 50/60 cm, ID 75 μ m

Injection: 150 mbar \times s

Voltage: -25 kV

Detection: 254 nm

Sample: soil (water extract)

Found (mg/kg):

- 1 – chloride (6)
- 2 – sulfate (58)
- 3 – oxalate (26)
- 4 – nitrate (423)
- 5 – formate (106)
- 6 – sphosphate (5)
- 7 – acetate (299)

