



Determination of water-soluble forms of **inorganic cations** in soils

INTRODUCTION

The content of water-soluble forms of inorganic cations is one of the substantial characteristics in agrochemical, land reclamation, and sanitary assessments of soils (arable, hayland, pasturable, forest nursery soils). The cation balance should be controlled during ecological soil monitoring for the human activity impact assessment.

The method is used for the determination of the mass concentration water-soluble forms of ammonium, potassium, sodium, magnesium and calcium in **soils, clays, peats, wastewater silts, activated, sludge, bottom sediments** by capillary electrophoresis.



MEASUREMENT METHOD

The measurement method is based on the extraction of water-soluble forms of cations with distilled water from a soil sample and subsequent separation, identification, and determination of analyzed components by the capillary electrophoresis method with indirect detection at wavelength of 267 nm.

MEASUREMENT RANGE

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

Component	Measurement range, mg/kg*
Ammonium, potassium, sodium	2–20 000
Magnesium	1–10 000
Calcium	2–10 000

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

Cations of lithium, strontium, barium, manganese, iron (II) do not deteriorate target components determination.

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. 0300001833**.

EXAMPLES OF REAL ANALYSES

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

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

Injection: 300 mbar \times s

Voltage: 25 kV

Detection: 267 nm

Sample: soil (water extract)

Found (mg/kg):

1 – ammonium (2)

2 – potassium (10)

3 – sodium (51)

4 – magnesium (8.5)

5 – calcium (93)

