



Determination of **anions** in fertilizers

INTRODUCTION

The method is used for the determination of the mass concentration of water-soluble forms and total contents of anions: chloride, sulfate (including sulfur, sulfur oxide (VI)), nitrate (including nitrate nitrogen), and phosphate (phosphorus, phosphorus oxide (V)) in samples of **inorganic, organo-mineral, organic fertilizers and fertilizer raw materials** by capillary electrophoresis.



MEASUREMENT METHOD

The measurement method is based on the extraction of anions from a sample by distilled water (for water-soluble forms), or hydrochloric acid solution (for total content), and their subsequent separation, identification, and determination by capillary electrophoresis with indirect UV detection at wavelength of 254 nm.

MEASUREMENT RANGE

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

Compound	Measurement range, %
Chloride	0.010–40.0
Sulfate	0.010–75.0
Sulfur (S)	0.003–25.1
Sulfur oxide (VI)	0.008–62.5
Nitrate	0.010–80.0
Nitrate nitrogen (N)	0.002–18.1
Phosphate	0.010 –85.0
Phosphorus (P)	0.003–27.7
Phosphorus oxide (V) (P_2O_5)	0.007–63.5

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. 0300004760**.

EXAMPLES OF REAL ANALYSES

BGE: chromate, with diethanolamine and CTA-OH

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

Injection: 150 mbar $\times$ s

Voltage: -25 kV

Detection: 254 nm, indirect

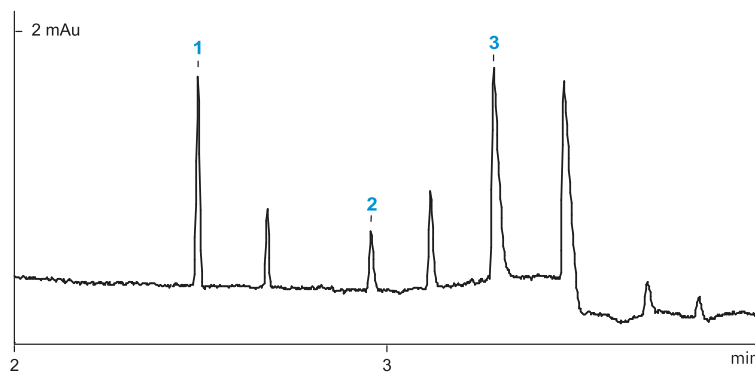
Sample: organo-mineral fertilizer,
water-soluble form

Found (%):

1 – chloride (0.044)

2 – nitrate (0.023)

3 – phosphate (0.077)



Sample: inorganic fertilizer, *total content*

Found (%):

1 – sulfur oxide (VI) (22.6)

2 – phosphorus oxide (V) (P_2O_5) (18.6)

