DETERMINATION OF ANIONS IN FEEDSTUFFS, COMPOUND FEEDS, AND FEED RAW MATERIALS

Lumex Method M 04-73-2011

INTRODUCTION
The method is used for the determination of the mass fraction of water-soluble chloride, nitrate, phosphate, and total sulfate in all types of feedstuffs, compound feeds, fodders, premixes, fodder additives, and feed raw materials (of plant, animal, and mineral origin) by capillary electrophoresis.

MEASUREMENT METHOD
The measurement method is based on capillary zone electrophoresis with indirect UV detection at the wavelength of 254 nm.

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

<table>
<thead>
<tr>
<th>Compound</th>
<th>Measurement range*, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloride</td>
<td>0.005–60</td>
</tr>
<tr>
<td>Nitrate</td>
<td>0.002–1.0</td>
</tr>
<tr>
<td>Phosphate</td>
<td>0.005–80</td>
</tr>
<tr>
<td>Sulfate</td>
<td>0.005–70</td>
</tr>
</tbody>
</table>

* For the sample weight of 100–500 mg.

The determination of phosphate is not hindered by the presence of carbonate (with mass concentration ratio of 10:1) and all other analytes (with mass concentration ratio of 1000:1). The determination is not hindered by the presence of other inorganic anions, organic acids (acetic, citric, lactic, formic, oxalic) and neutral organic substances.

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/7/8/10 operating system with installed dedicated software package ELFORUN.

Lumex Instruments set, order No 0300001921.

EXAMPLES OF REAL ANALYSES
BGE: chromate, with diethanolamine and CTA-OH
Capillary: L_{eff} / L_{tot} 50/60 cm, ID 75 µm
Injection: 150 mbar x sec
Voltage: – 25 kV
Temperature: + 20 °C
Detection: 254 nm

Sample: poultry meal

Measurement results (water-soluble forms):
1 – chloride (0.42%)
2 – nitrate (0.03%)

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1 National Standard GOST R 56375-2015.
Sample: poultry meal

Measurement results
(total content):
1 – sulfate (0.09%)
2 – phosphate (3.4%)