DETERMINATION OF **ORGANIC ACIDS**
IN FEEDSTUFFS AND FODDER ADDITIVES

**Lumex Method M 04-74-2012**

**INTRODUCTION**
The method is used for the determination of the mass concentration of oxalic, formic, fumaric, succinic, malic, citric, acetic, propionic, lactic, benzoic, sorbic, butyric acids in **fodder additives** and butyric acid in **silage and haylage** by capillary electrophoresis.

For the determination of ascorbic acid and its salts in food additives and fodder additives use the method M 04-86-2016 (Lumex Instruments set, order No 0300002717).

**MEASUREMENT METHOD**
The measurement method is based on capillary zone electrophoresis with direct UV detection at the wavelength of 190 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>
<th>Compound</th>
<th>Measurement range, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetic acid</td>
<td>0.1–80</td>
<td>Lactic acid</td>
<td>0.12–80</td>
</tr>
<tr>
<td>Benzoic acid</td>
<td>0.005–50</td>
<td>Malic acid</td>
<td>0.05–80</td>
</tr>
<tr>
<td>Butyric acid</td>
<td>0.05–50</td>
<td>Oxalic acid</td>
<td>0.03–10</td>
</tr>
<tr>
<td>Citric acid</td>
<td>0.05–80</td>
<td>Propionic acid</td>
<td>0.1–80</td>
</tr>
<tr>
<td>Formic acid</td>
<td>0.15–80</td>
<td>Sorbic acid</td>
<td>0.025–50</td>
</tr>
<tr>
<td>Fumaric acid</td>
<td>0.005–80</td>
<td>Succinic acid</td>
<td>0.05–80</td>
</tr>
</tbody>
</table>

Inorganic anions (chloride, sulfate, nitrate and phosphate) in concentrations, typical for the mentioned samples do not deteriorate organic acids 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® XP/7/8/10** operating system with installed dedicated software package **ELFORUN**.

Lumex Instruments set, order **No 0300001897**.

**EXAMPLES OF REAL ANALYSES**

**BGE:** phosphate, with CTAB

**Capillary:** \( L_{\text{eff}} / L_{\text{tot}} = 40/50 \text{ cm, ID 50} \mu \text{m} \)

**Injection:** 150 mbar x sec

**Voltage:** – 17 kV

**Temperature:** + 20 °C

**Detection:** 190 nm

**Sample:** fodder additive

**Measurement results:**
1 – formic acid (9.4%)
2 – fumaric acid (0.5%)
3 – acetic acid (4.4%)
4 – propionic acid (11%)
5 – benzoic acid (0.22%)
6 – sorbic acid (0.25%)

The contents on this paper are subject to change without notice.
To get more specific information, please contact the representative by **sales@lumexinstruments.com**

---