



Determination of **inorganic anions, cations, and organic acids** in fermentation liquids

INTRODUCTION

Capillary electrophoresis analyses of particularly complex samples can be highly problematic due to the presence of many compounds, deteriorating the separation inside the capillary. Fermentation liquid is one of such samples, full of proteins, cell debris, and lipids. At the same time accurate analysis of fermentation liquid for the presence of inorganic anions, or cations, or organic acids can be of utmost importance to ensure the correct way of the whole process. For example, the elevated values of acetic acid can indicate certain deviations in the technology of fermentation, phosphates are important for the microorganism's vitality, etc.

Analytical protocols for the determination of inorganic anions, inorganic cations, and organic acids, developed by Lumex Instruments, enable to detect the target compounds even in a fermentation liquid. This is possible because the capillary electrophoretic conditions provide migration of the targets in the time range, far earlier than the rest of the sample components migrate. Besides some certain additives to the electrolyte buffer prevent sorption of matrix components to the capillary wall, thus ensuring the highest level of reproducibility and precision of the analysis.

MEASUREMENT METHOD

The measurement method is based on capillary electrophoresis separation of the fermentation liquid components with their indirect detection at 254 nm (for anions and organic acids) or 267 nm (for cations and amines).

EQUIPMENT AND REAGENTS

The «Capel» capillary electrophoresis system is used in all measurements. Data acquisition, collection, processing, and output are performed using a personal computer running under Windows® 7/8/10 operating system with installed dedicated software package Elforun.

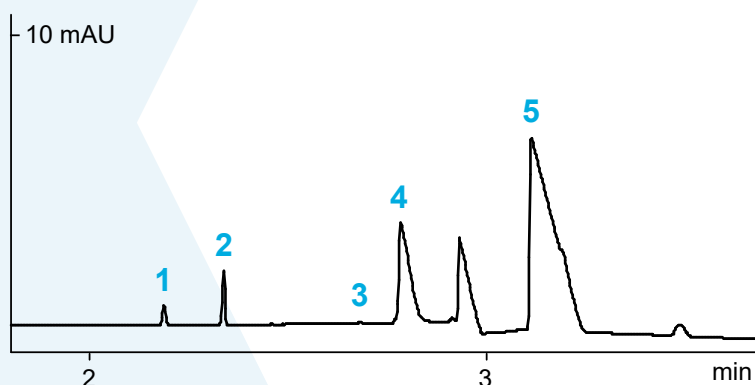
EXAMPLES OF REAL ANALYSES

Determination of inorganic anions with some organic acids

Sample: fermentation liquid, showing severe deviations in the process

BGE: chromate, with additives
Capillary: $L_{\text{eff}}/L_{\text{tot}} = 50/60$ cm, ID 75 μm
Injection: 150 mbar \times sec
Voltage: - 25 kV
Temperature: + 20 °C
Detection: 254 nm
Sample pretreatment: filtration, dilution, and centrifugation

Found: mg/L
1 – chloride 213.4
2 – sulfate 616.3
3 – formate 20.58
4 – phosphate 3196
5 – acetate 17420



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