Capel

Capillary electrophoresis system

Determination of lactose in lactose-free milk processing products

INTRODUCTION

Lumex Instruments proposed the method for determination of lactose content in lactose-free milk processing products by capillary electrophoresis.
For the determination of lactose, fructose, glucose, and saccharose content in other types of products (including determination of lactose in products with lactose content of less than 1 %), it is recommended to use Lumex Instruments set **No. 0300002753**.

MEASUREMENT METHOD

The method is based on extracting the component from samples with distilled water, obtaining derivatives, further separation, identification and determination of the mass concentration of lactose by capillary electrophoresis.
The component is detected at a wavelength of 305 nm.

MEASUREMENT RANGE

The measurement ranges for the mass concentration of lactose is **0.004 % – 0.7 % (0.04–7.0 g/L)**.
Specially selected conditions for electrophoretic separation eliminate the interfering effects of glucose and galactose, which are present in significant quantities in lactose-free products.

EQUIPMENT AND REAGENTS

The following equipment and reagents are used in the measurements:

- Capel capillary electrophoresis system;
- sodium hydroxide, ≥98 %;
- sodium tetraborate decahydrate, ≥98 %;
- sodium cyanoborohydride, ≥95 %;
- benzocaine (ethyl 4-aminobenzoate), ≥98 %;
- methanol, ≥99.5 %;
- chloroform, ≥99 %;
- acetic acid, ≥99.7 %;
- D-lactose monohydrate, ≥98 %.

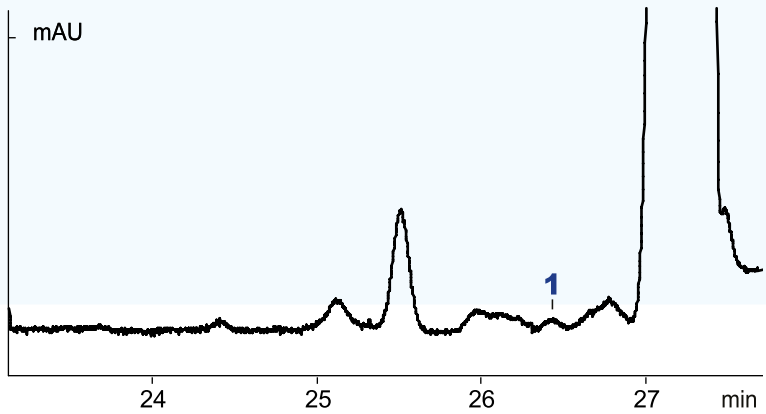
Data acquisition, collection, processing, and output are performed using a personal computer running under Windows® operating system with Elforun software installed.

EXAMPLES OF REAL ANALYSES

BGE: borate
Capillary: L_{eff}/ L_{tot} 90/100 cm, ID 75 µm
Sample injection: 250 mbar × s
Voltage: 25 kV
Detection: 305 nm

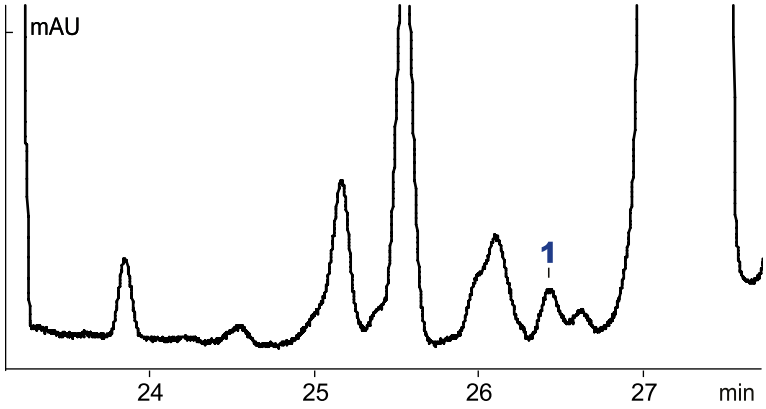
Sample: lactose-free milk

Found (%):
1 – lactose (<0.004)



Sample: lactose-free yoghurt

Found (%):
1 – lactose (0.006)



Sample: lactose-free yoghurt produced with a violation of technology

Found (%):
1 – lactose (0.29)