



DETERMINATION OF **PRESERVATIVES (BENZOIC, SORBIC ACIDS AND THEIR SALTS)** AND **SWEETENERS (ACESULFAME K, SACCHARINE AND ITS SALTS)** IN FOOD PRODUCTS AND RAW MATERIALS, AND DIETARY SUPPLEMENTS

LUMEX Method M 04-59 (2009)

INTRODUCTION

Various food additives – preservatives (benzoic acid, sorbic acid, and their salts), sweeteners (Acesulfame K, saccharine and its salts) and others are widely used in food industry for the improvement of food products properties and extension of storage life. The amount of these additives in food products is regulated by technical instructions and other norms.

MEASUREMENT METHOD

The measurement method is based on extraction of the determined components from a sample with hot water, their separation and quantitative determination by capillary electrophoresis method with micellar electrokinetic chromatography. Detection of the determined components is performed in the UV spectrum range at 254nm wavelength.

MEASUREMENT RANGE

Additive	E code	Range*, mg/kg	Determined form
Sorbic acid Sodium sorbate Potassium sorbate Calcium sorbate	E 200 E 201 E 202 E 203	20–10000	Sorbic acid
Benzoic acid Sodium benzoate Potassium benzoate Calcium benzoate	E 210 E 211 E 212 E 213		Benzoic acid
Acesulfame K (potassium acesulfame)	E 950		Acesulfame K
Saccharine, sodium saccharinate, potassium saccharinate, calcium saccharinate	E 954		Sodium saccharinate

* for every mentioned form of the additive

The separation of different forms of the additives E200–E203, E210–E213, and E954 is not possible in the framework of the method.

Aspartame, cyclamate, sodium glutamate, synthetic dyes, vitamins of the B group, vitamin C, vanillin, caffeine, theobromine in the concentrations that are typical for the products of interest does not influence the determination of the components.

EQUIPMENT AND REAGENTS

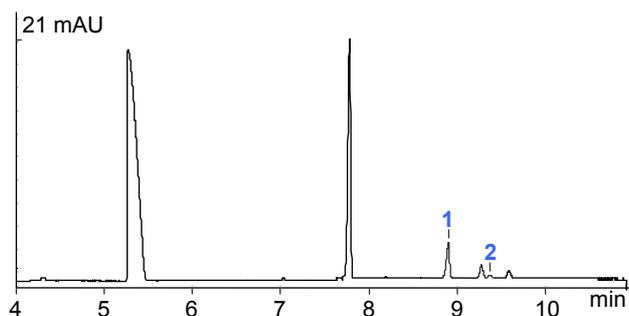
The "CAPEL[®]" capillary electrophoresis system with high-voltage positive polarity is used in measurements. Data acquisition, collection, processing and output are performed using a personal computer running under "WINDOWS[®] 2000/XP" operating system with installed dedicated software package for acquisition and processing of chromatography data.

All reagents must be of analytical grade or better.

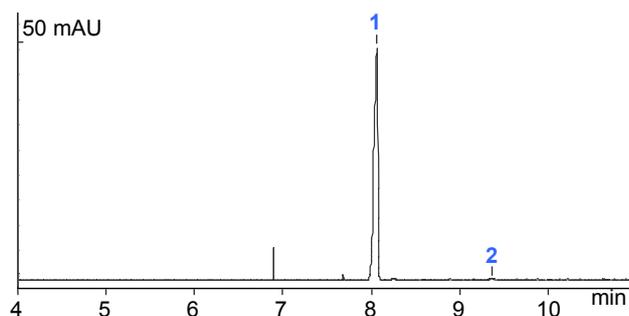


EXAMPLES OF REAL ANALYSES

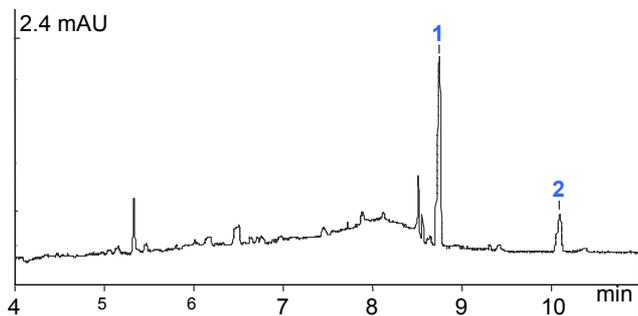
Buffer: borate, with SDS
Capillary: L_{eff}/ L_{tot} 50/60 cm,
ID 75 µm
Injection: 150 mbar x sec
Voltage: + 25 kV
Temperature: + 20 °C
Detection: 254 nm



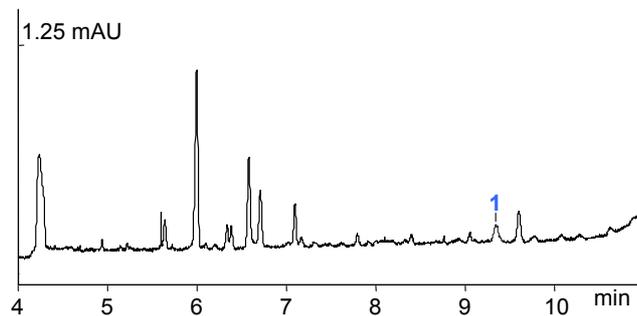
Sample: dietary supplement
Measurement results:
1 – benzoic acid (600 mg/kg)
2 – sodium saccharinate (77 mg/kg)



Sample: mayonnaise sauce
Measurement results:
1 – sorbic acid (725 mg/kg)
2 – sodium saccharinate (35 mg/kg)



Sample: Soya sauce
Measurement results:
1 – benzoic acid (440 mg/kg)
2 – acesulfame K (87 mg/kg)



Sample: canned beans
Measurement results:
1 – sodium saccharinate (32 mg/kg)

The content of this application note is subject to change without notice.