



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.

The method is used for measuring the concentrations of preservatives (sorbic and benzoic acids and their salts) and sweeteners (acesulfame K, saccharin and its salts) in **food products and raw materials, and dietary supplements**.

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 254 nm wavelength.

MEASUREMENT RANGE

Measurement ranges of analyzed components are presented in the table below.

Compound	CSFA code	E number	Determined form	Measurement range*, mg/kg
Sorbic acid	INS 200	E 200	Sorbic acid	20–10 000
Sodium sorbate	INS 201	E 201		
Potassium sorbate	INS 202	E 202		
Calcium sorbate	INS 203	E 203		
Benzoic acid	INS 210	E 210	Benzoic acid	
Sodium benzoate	INS 211	E 211		
Potassium benzoate	INS 212	E 212		
Calcium benzoate	INS 213	E 213		
Acesulfame K (potassium acesulfame)	INS 950	E 950	Acesulfame K	
Saccharin	INS 954(i)	E 954(i)	Sodium saccharin	
Calcium saccharin	INS 954(ii)	E 954(ii)		
Potassium saccharin	INS 954(iii)	E 954(iii)		
Sodium saccharin	INS 954(iv)	E 954(iv)		

* For every mentioned form of the food additive.

The separation of different forms of the additives E 200 – E 203, E 210 – E 213, and E 954 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

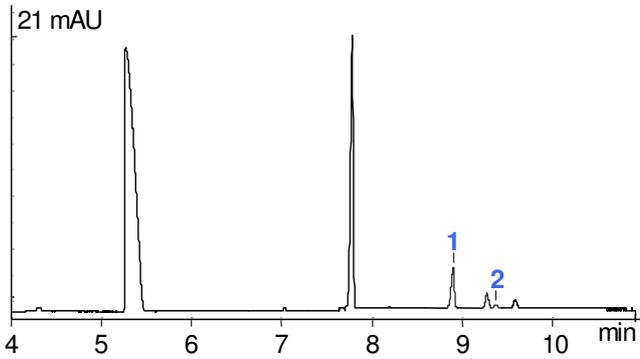
The CAPEL capillary electrophoresis system is used in measurements. Data acquisition, collection, processing and output are performed using a personal computer running under WINDOWS® XP/7/8/10 operating system with installed dedicated software package ELFORUN.

Lumex Instruments complex set, order **No 0300002054**.

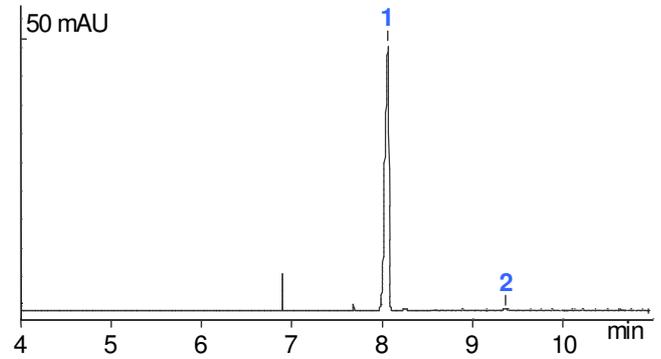


EXAMPLES OF REAL ANALYSES

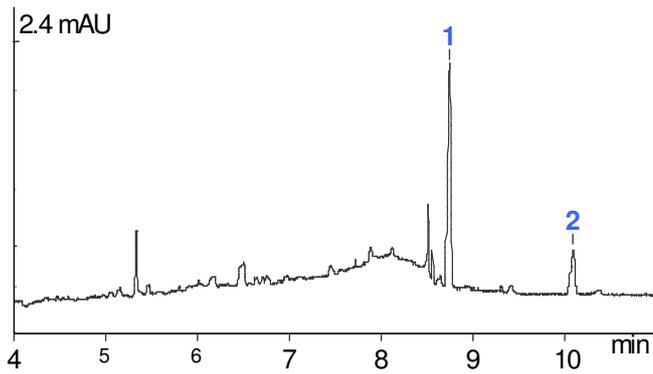
BGE: borate, with SDS
Capillary: $L_{\text{eff}}/L_{\text{tot}}$ 50/60 cm, ID 75 μm
Injection: 150 mbar x sec
Voltage: + 25 kV
Temperature: + 20 °C
Detection: 254 nm



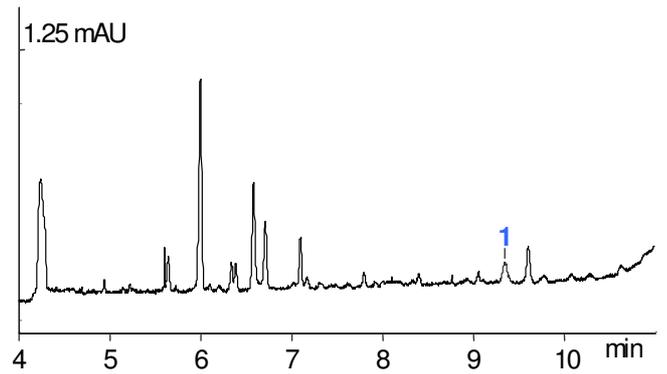
Sample: dietary supplement
Measurement results:
1 – benzoic acid (600 mg/kg)
2 – sodium saccharinate (80 mg/kg)



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 (90 mg/kg)



Sample: canned beans
Measurement results:
1 – sodium saccharinate (30 mg/kg)

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