



# Determination of **glutamic acid** and **its salts** in food and food additives

## INTRODUCTION

Flavor enhancers are commonly used in the food industry to improve both taste and aroma. They can be found in meat and fish products, processed vegetables, mushrooms, sauces, ketchups, instant meals, bouillon cubes, seasoning, snacks, and confectionery. One of the most well-known flavor enhancers is E621 – monosodium glutamate (MSG).

Lumex Instruments proposed the method for determination of the mass fraction of free forms of glutamic acid and its salts (E620–E625) in samples of **food products**, **food raw materials**, and **food additives** by capillary electrophoresis (CE).

Food products can contain substantial amounts of naturally occurring glutamic acid in both free and bound forms. This method determines the total content of free forms of glutamic acid, whether naturally present or added as a food additive. The method does not cover the determination of bound forms of glutamic acid found in proteins and peptides.



## MEASUREMENT METHOD

The measurement method is based on extraction of glutamic acid from a solid sample by water and their determination by capillary electrophoresis with direct UV detection at the wavelength of 200 nm.

## MEASUREMENT RANGE

The measurement ranges of mass concentration of glutamic acid are:

- **1.0–100 g/kg** for food products and food raw materials;
- **2.5–100 %** for food additives.

Compound	E number *	Determined form
Glutamic acid	E620	Glutamic acid
Monosodium glutamate	E621	
Monopotassium glutamate	E622	
Calcium diglutamate	E623	
Monoammonium glutamate	E624	
Magnesium diglutamate	E625	

\* According to EU classification

The method does not allow to determine individual forms of food additives E620–E625.

## 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® operating system with Elforun software installed.

## EXAMPLES OF REAL ANALYSES

**BGE:** borate

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

**Voltage:** 25 kV

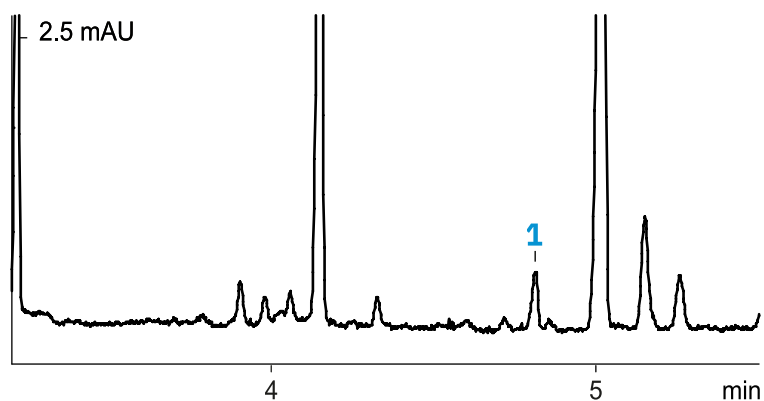
**Detection:** 200 nm

**Scheme 1** (for analysis of food products)

**Sample:** noodle salad with dressing

**Found (g/kg):**

**1** – glutamic acid (1.2)



**Scheme 2** (for analysis of food additives)

**Sample:** food additive

**Found (%):**

**1** – glutamic acid (7.1)

