



DETERMINATION OF AMINO ACIDS IN BEER AND WORT BY CAPILLARY ELECTROPHORESIS

INTRODUCTION

Free forms of amino acids in beer originate mostly from malt. The following method enables fast quantitative determination in beer and wort of the following free amino acids: arginine, lysine, tyrosine, phenylalanine, histidine, leucine and *iso*-leucine (total), methionine, valine, proline, alanine, glycine, cystine, tryptophan, aspartic and glutamic acids. Total content of amino acids is determined after hydrolysis of proteins..

MEASUREMENT METHOD

Free amino acids are transformed to phenylthiocarbamyl derivatives (PTC derivatives) by means of phenylisothiocyanate and their ionic forms are separated in the quartz capillary under the action of an electric field. The PTC derivatives are determined by measuring their own absorbance at 254 nm wavelength in a buffer solution.

MEASUREMENT RANGE

Amino acid	Measurement range*, mg/L	Amino acid	Measurement range*, mg/L	Amino acid	Measurement range*, mg/L
Ala	0.5–150	Gly	0.2–50	Pro	0.25–500
Arg	0.5–250	His	0.5–50	Ser	0.3–300
Asn	1.0–50	Ile+Leu	0.5–150	Thr	0.5–50
Asp	0.5–50	Lys	0.5–100	Trp	1.0–50
Gln	0.5–50	Met	0.4–50	Tyr	1.0–150
Glu	1.0–50	Phe	1.0–150	Val	0.4–150

* sample 100 µL

EQUIPMENT AND REAGENTS

The "CAPEL®-103RT/104T/105/105M" capillary electrophoresis system with a special capillary cassette for the amino acid analysis 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 higher.

EXAMPLE OF A REAL ANALYSIS

Buffer : phosphate, with β-cyclodextrin

Capillary: L_{eff}/L_{tot} 65 / 75 cm; ID 50 µm

Injection: 150 mbar x sec

Voltage: + 25 kV

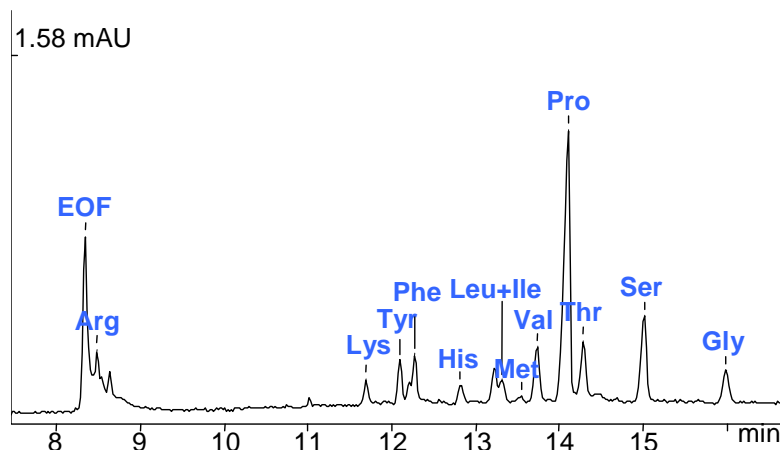
Temperature: + 30 °C

Detection: 254 nm

Sample: beer "X" (50 µL)

Measurement results (mg/L):

Arg – 225
Lys – 28.0
Tyr – 96.8
Phe – 113
His – 44.1
Leu+Ile – 91.9
Met – 14.8
Val – 91.5
Pro – 468
Thr – 91.6
Ser – 158
Gly – 38.9



The contents on this paper are subject to change without notice.