

# Application Data Sheet

## No.23

### GCMS

Gas Chromatograph Mass Spectrometer

## Analysis of Amino Acids Contained in Miso Soup

Amino acids contained in miso soup were treated with EZ:faast™ (Phenomenex, Inc.), which enables easy pretreatment, and then analyzed with a GC-MS system.

### Experiment

#### Pretreatment

Two kinds of miso soup (red miso and white miso) were treated with EZ:faast. Norvaline was added as an internal standard.

#### Instrument

A GCMS-QP2010 Ultra (with high-power oven) was used for the measurements. The analysis conditions, shown in Table 1, were in conformity with the "Amino Acid Analysis Methods" in the "GC/MS Metabolic Components Database."

Table 1: Analysis Conditions (GC/MS Metabolic Components Database: Amino Acid Analysis Methods)

GC-MS	: GCMS-QP2010 Ultra (with high-power oven)	[MS]	Interface temperature: 280°C
Column	: ZB-AAA (length: 10 m, 0.25 mm I.D.) (Phenomenex, Inc.)		Ion source temperature: 200°C
[GC]			Solvent elution time : 0.4 min
Injection quantity	: 1 μL		Data sampling time : 0.5 min to 7 min
Vaporization chamber temperature	: 280°C		Measurement mode : Scan
Column oven temperature: 110°C → (30 °C/min) → 320°C			Mass range : $m/z$ 45–450 (3,333u/sec)
Control mode	: Constant pressure (15 kPa)		Event time : 0.15 sec
Injection mode	: Split		
Split ratio	: 15		
Carrier gas	: Helium		

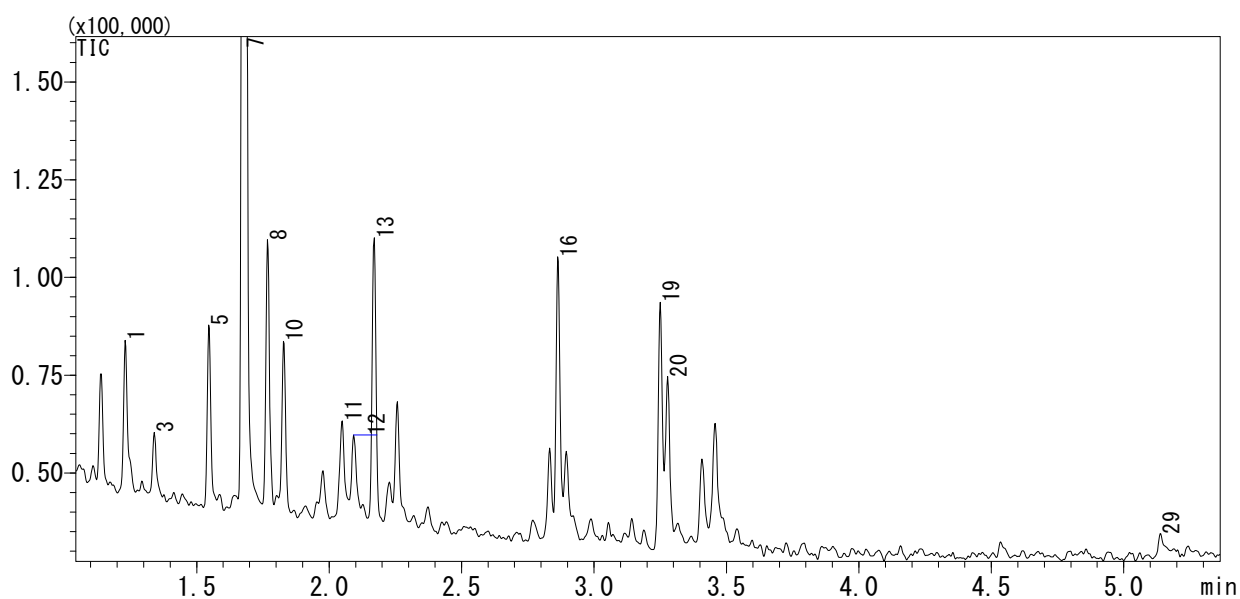


Fig. 1: Total Ion Current Chromatogram (TIC) for Amino Acid Derivatives in Red Miso Soup

The numbers for each component follow the serial numbers in the "GC/MS Metabolic Components Database."

1 Alanine	8 Leucine	13 Proline	29 Tyrosine
3 Glycine	10 Isoleucine	16 Aspartic acid	
5 Valine	11 Threonine	19 Glutamic acid	
7 Norvaline(I.S.)	12 Serine	20 Phenylalanine	

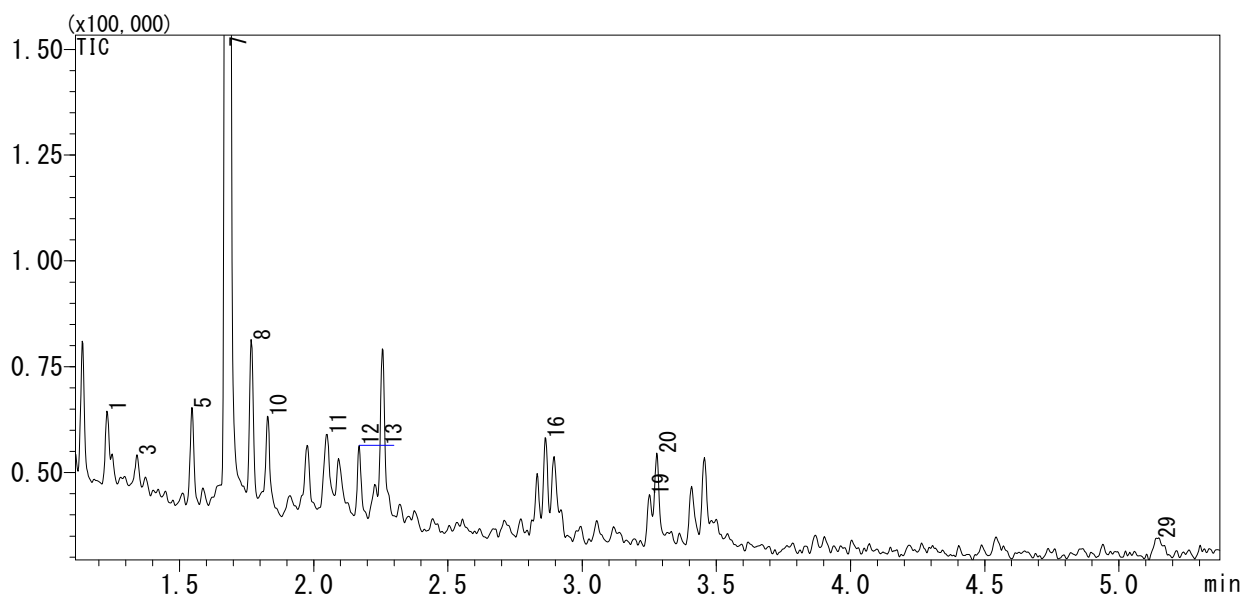


Fig. 2: Total Ion Current Chromatogram (TIC) for Amino Acid Derivatives in White Miso Soup

The numbers for each component follow the serial numbers in the "GC/MS Metabolic Components Database."

1 Alanine	8 Leucine	13 Proline	29 Tyrosine
3 Glycine	10 Isoleucine	16 Aspartic acid	
5 Valine	11 Threonine	19 Glutamic acid	
7 Norvaline(I.S.)	12 Serine	20 Phenylalanine	

## Summary

Pretreatment using the EZ:faast kit, following by analysis using the GCMS-QP2010 Ultra, which is equipped with a high-speed scanning function, enabled rapid analysis of amino acids. With this combination, it took only 15 minutes per sample from pretreatment to analysis.

(Reference: Shimadzu Application News No. M246, Analysis of Amino Acids Using Fast-GC/MS and Metabolite Database)

