

Application Data Sheet

No. 14

GCMS

Gas Chromatograph Mass Spectrometer

Analysis of Amino Acids Contained in Green Tea

Amino acids contained in green tea were treated with EZ:faast™ (Phenomenex, Inc.), which enables easy pretreatment, and then analyzed by GC-MS.

Experiment

Pretreatment

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

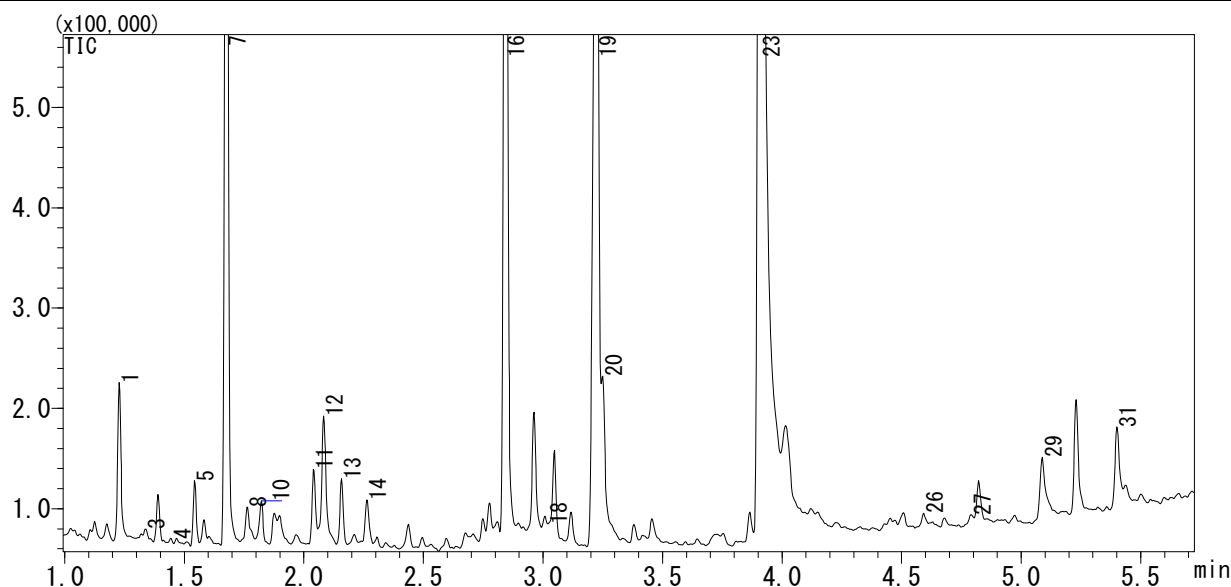


Fig. 1: Total Ion Current Chromatogram (TIC) for Amino Acid Derivatives in Green Tea
The numbers for each component follow the serial numbers in the "GC/MS Metabolic Components Database."

1 Alanine	8 Leucine	14 Asparagine	23 Glutamine
3 Glycine	10 Isoleucine	16 Aspartic acid	26 Lysine
4 α -aminobutyric acid	11 Threonine	18 4-Hydroxyproline	27 Histidine
5 Valine	12 Serine	19 Glutamic acid	29 Tyrosine
7 Norvaline (I.S.)	13 Proline	20 Phenylalanine	31 Tryptophan

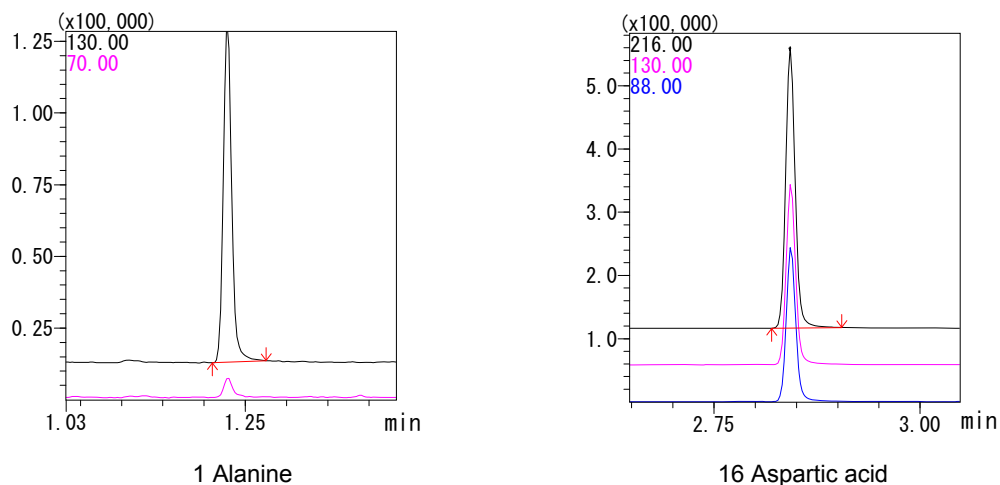


Fig. 2: Examples of Mass Chromatograms for Amino Acid Derivatives

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)

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SHIMADZU CORPORATION. International Marketing Division

3. Kanda-Nishikicho 1-chome, Chiyoda-ku, Tokyo 101-8448, Japan

Phone: 81(3)3219-5641 Fax: 81(3)3219-5710

URL <http://www.shimadzu.com>