

Application Data Sheet

No. 13

GCMS

Gas Chromatograph Mass Spectrometer

Analysis of Amino Acids Contained in a Sports Drink

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

Experiment

Pretreatment

Two sports drinks 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)		
Column	: ZB-AAA (length: 10 m, 0.25 mm I.D.) (Phenomenex, Inc.)		
[GC]		[MS]	
Injection quantity	: 1 µL	Interface temperature	: 280°C
Vaporization chamber temperature	: 280°C	Ion source temperature	: 200°C
Column oven temperature	: 110°C → (30 °C/min) → 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

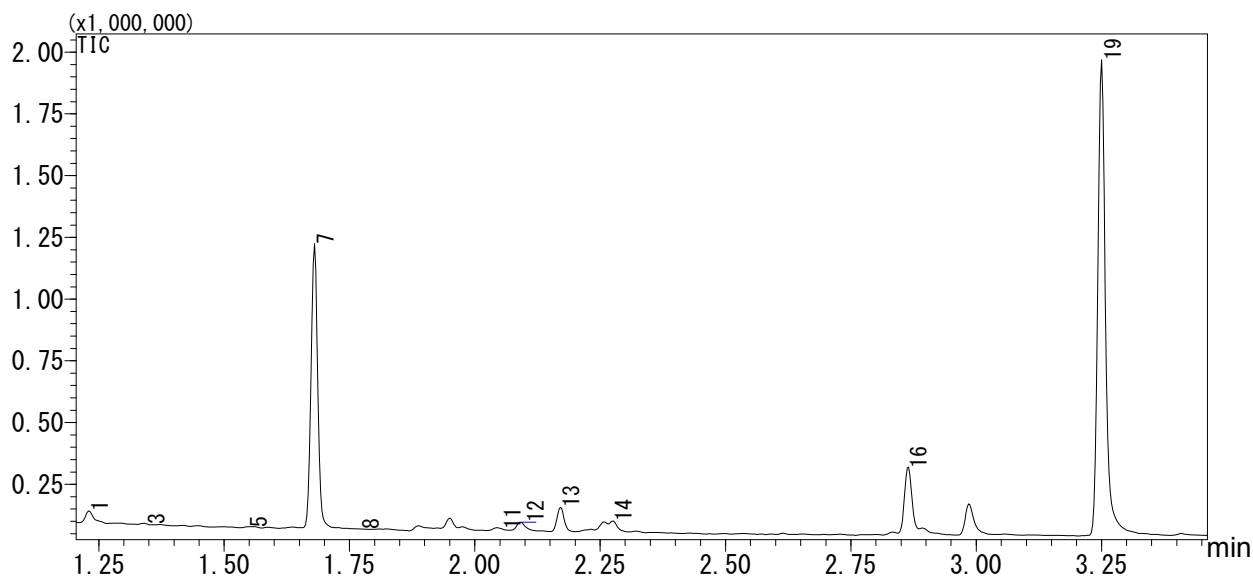


Fig. 1: Total Ion Current Chromatogram (TIC) for Amino Acid Derivatives in Sports Drink A
The numbers for each component follow the serial numbers in the "GC/MS Metabolic Components Database."

1 Alanine	7 Norvaline(I.S.)	12 Serine	16 Aspartic acid
3 Glycine	8 Leucine	13 Proline	19 Glutamic acid
5 Valine	11 Threonine	14 Asparagine	

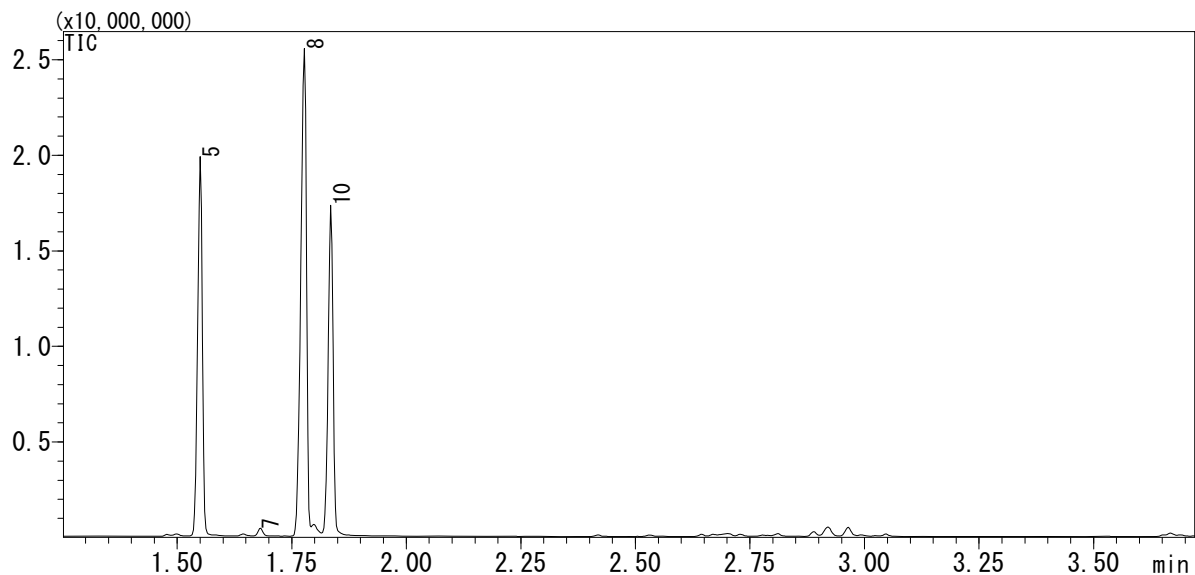


Fig. 2: Total Ion Current Chromatogram (TIC) for Amino Acid Derivatives in Sports Drink B
The numbers for each component follow the serial numbers in the "GC/MS Metabolic Components Database."

5 Valine 7 Norvaline(I.S.) 8 Leucine 10 Isoleucine

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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