

## GCMS

Gas Chromatograph Mass Spectrometer

 Analysis of Soft Drinks Utilizing  
Headspace GC-MS

With the headspace method, samples are inserted into vials, and the headspace gas is introduced into a GC column, enabling simple measurement of fragrant components. This article introduces the results of the measurement of various soft drinks using Headspace GC-MS.

## Experiment

Fig. 1 provides an overview of the headspace method. The sample placed in the vial is heated for a prescribed time, after which a prescribed amount of the gas phase component (headspace) is extracted and then introduced to the GC or GC-MS system. The analysis conditions are shown in Table 1.

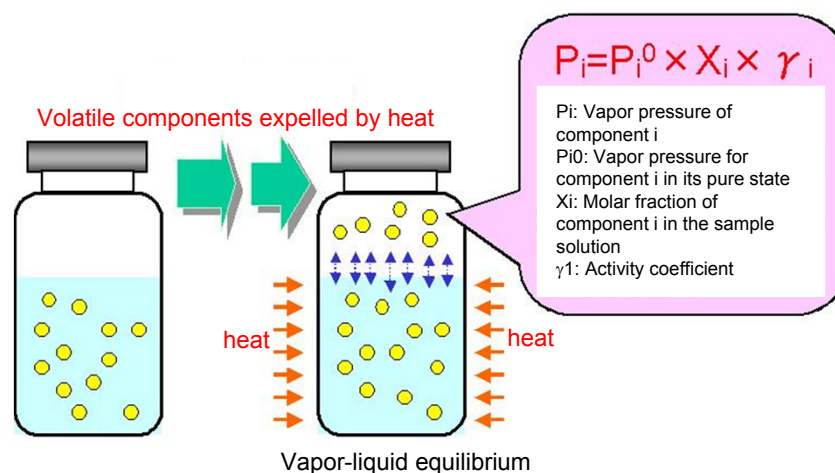


Fig. 1: Principle of the Headspace Method

Table 1: Analysis Conditions

HS	:TurboMatrix HS		
GC-MS	:GCMS-QP2010 Ultra		
[HS]		[GC]	
Headspace mode	:Constant	Vaporization chamber temperature:	200°C
Injection time	:0.2 min	Column	:Stabilwax (60 mL. x 0.32 mmI.D., 0.5 µm)
Zone temperature settings	:(O/N/T)	Column oven temperature	:40°C (1min)→(5°C/ min)→230°C (1 min)
Oven temperature	:80°C	Carrier gas	:Helium
Needle temperature	:100°C	[MS]	
Transfer temperature	:180°C	Interface temperature	: 230°C
Sample shaker	:OFF	Solvent elution time	: 2.5 min
GC cycle time	:50 min	Measurement mode	: Scan
Pressurization time	:1 min	Event time	: 0.5 sec
Uptake time	:0 min	Detector voltage	: 0.1 kV (relative value)
Warming time	:30 min		
HS carrier gas pressure	:120 kPa		
		Ion Source Temperature:	200°C
		Data sampling time:	3 min to 25 min
		Mass range:	$m/z$ 29-350
		Emission current:	150 µA (high sensitivity)

Results

10 mL samples of commercially-available apple, orange, and grape juice were placed in headspace vials and analyzed. The results of the measurements are shown in Fig. 2.

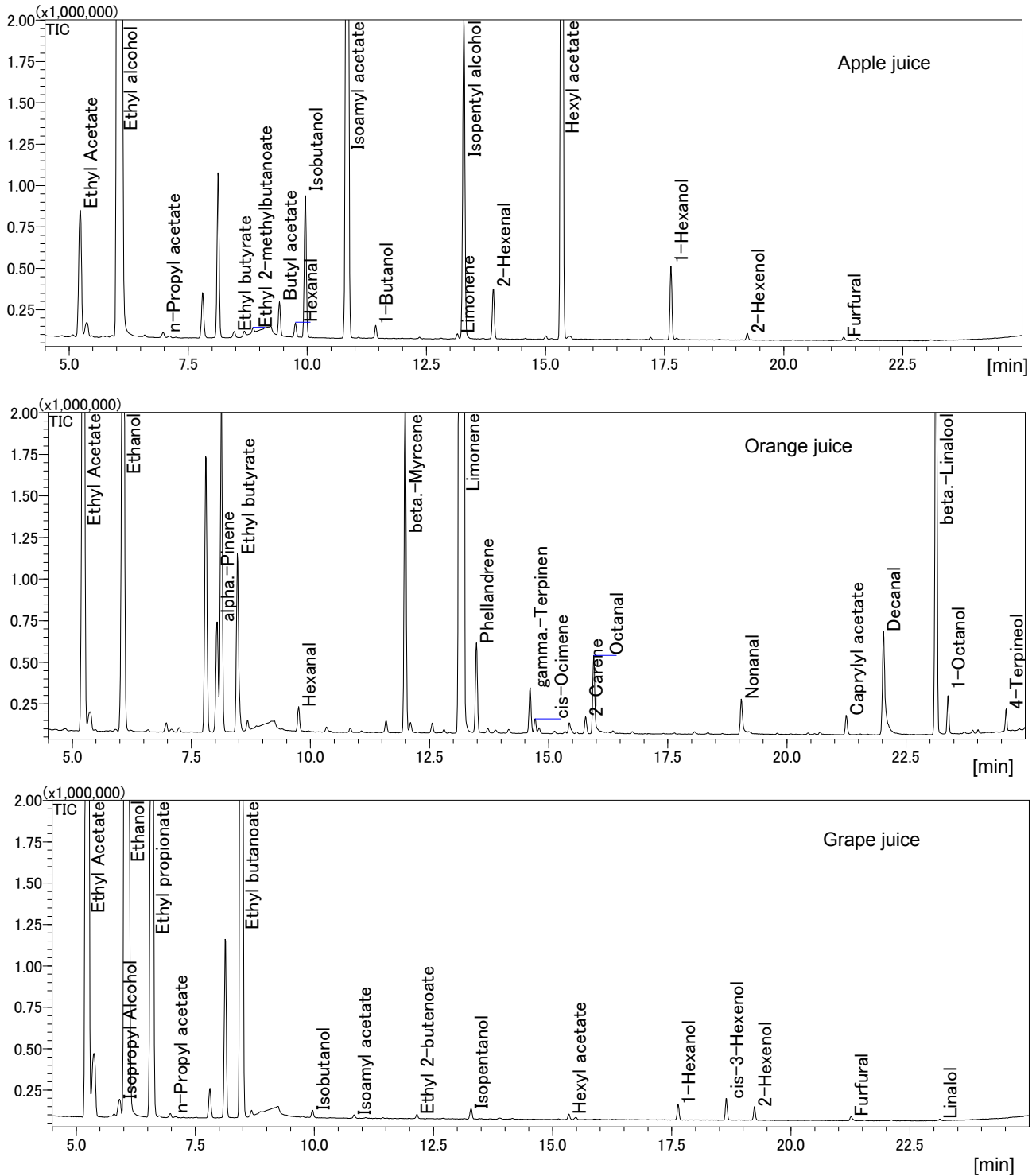


Fig. 2: Total Ion Current Chromatograms

