

4.12 Analysis of Beverage Odors (1) - GCMS

•Explanation

2,4,6-trichloroanisole (2,4,6-TCA), a cause of musty odor, is contained in wood and paper-manufactured packing materials, and its transfer to food products and drinking water may cause problem. The perceptual threshold value of TCA in water is extremely low at the ppt level. Conventionally, 2,4,6-TCA was analyzed by solvent extraction or steam distillation method, but these methods require a lot of time and are extremely complicated; moreover, the poor collection rate would make ppt-level measurement difficult.

Here, measurement was conducted using a combination of the Chrompack CP4010 and Tenax trapping set. In this method, the sample is purged to collect the target components in the trap tube. The trap tube is heated by the TCT mode of the CP4010, and the desorped components are analyzed by GCMS.

This system setup is an offline one, so the Tenax unit is easy to clean and there is no sample memory.

•Analytical Conditions

Instrument	: GCMS-QP5000
Column	: DB-1701 0.32mm × 30m df = 1.0μm
Col.Temp.	: 50°C(2min)-140°C(30°C/min) -220°C(10°C/min)
I/F Temp.	: 250°C
Carrier Gas	: He(50kPa)
- TCT -	
Instrument	: GP4010(TCT mode)
Sample Size	: 25mL(50°C)
Trap Tube	: Tenax GR
Purge	: 50°C, 15min, 100mL/min
Desorption	: 250°C, 5min

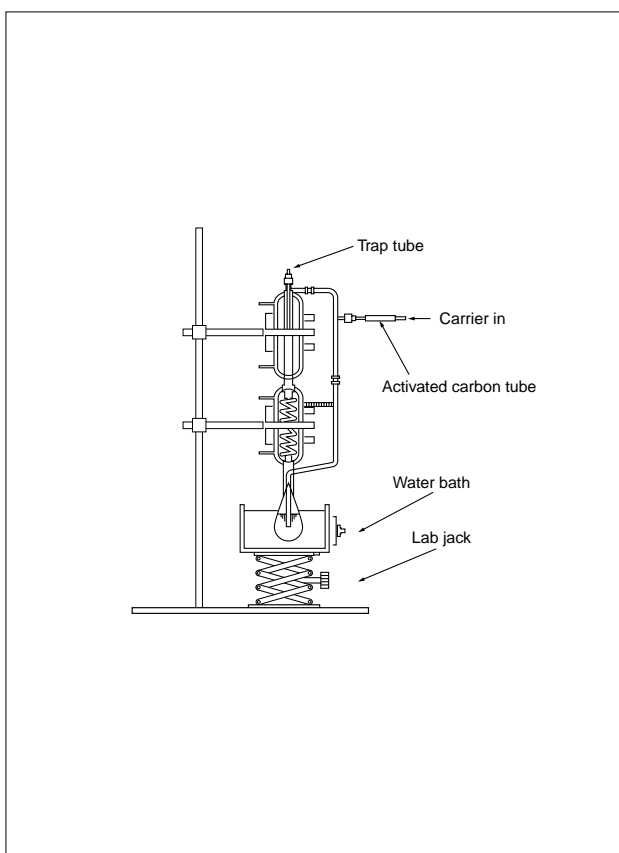


Fig. 4.12.1 Schematic diagram of Tenax Trapping Set

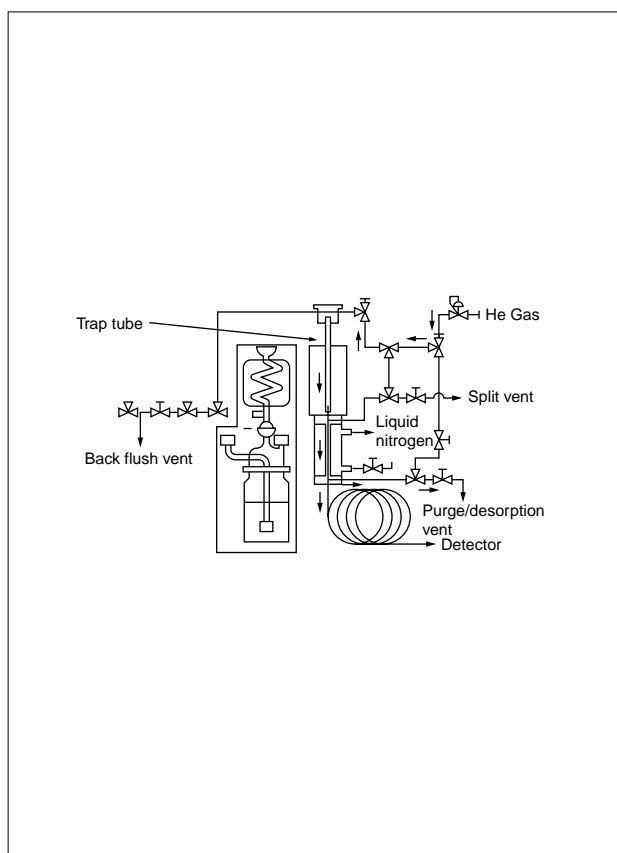


Fig. 4.12.2 TCT main unit flow line diagram



4.12 Analysis of Beverage Odors (2) - GCMS

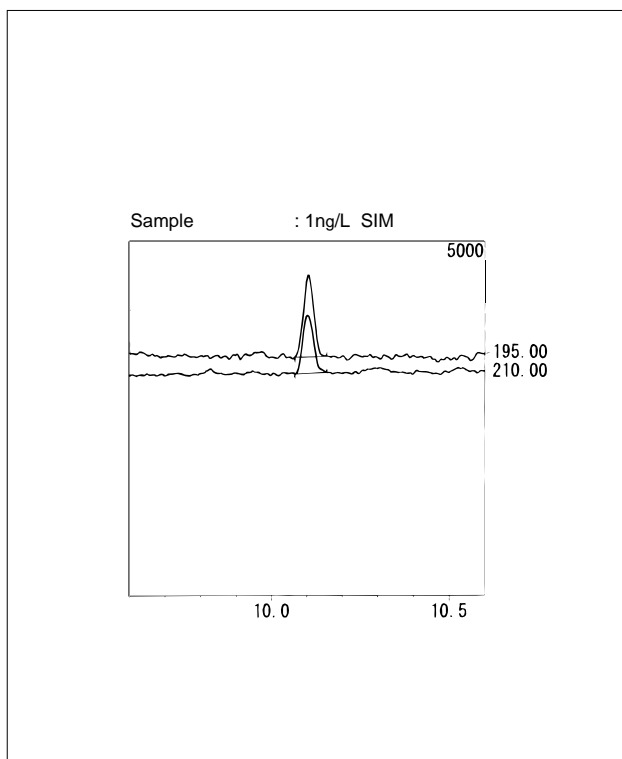


Fig. 4.12.3 SIM chromatogram (1ng/L)

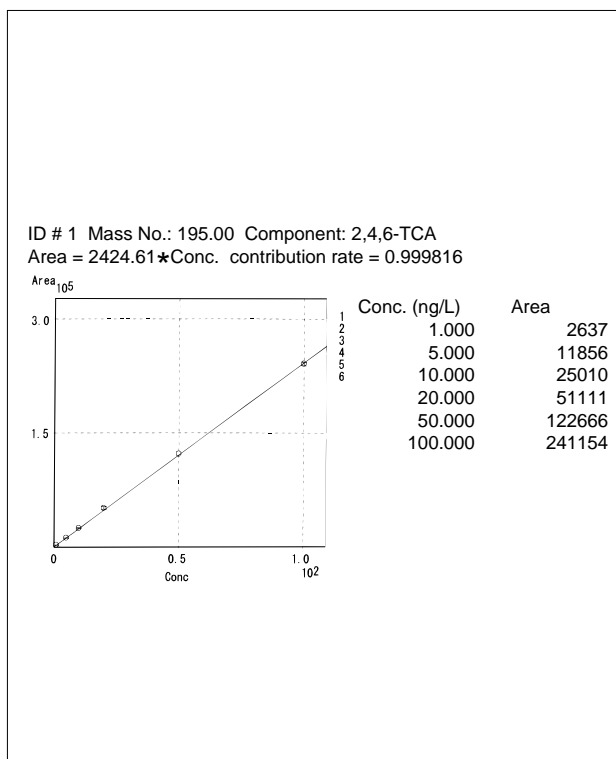


Fig. 4.12.4 TCA calibration curve (1 to 100ng/L)

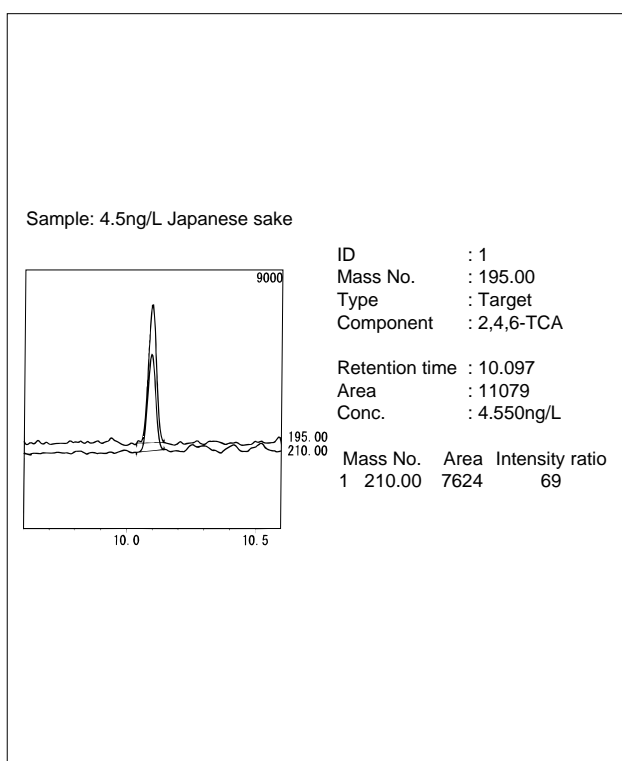


Fig. 4.12.5 Analysis of Japanese sake (4.5ng/L added)

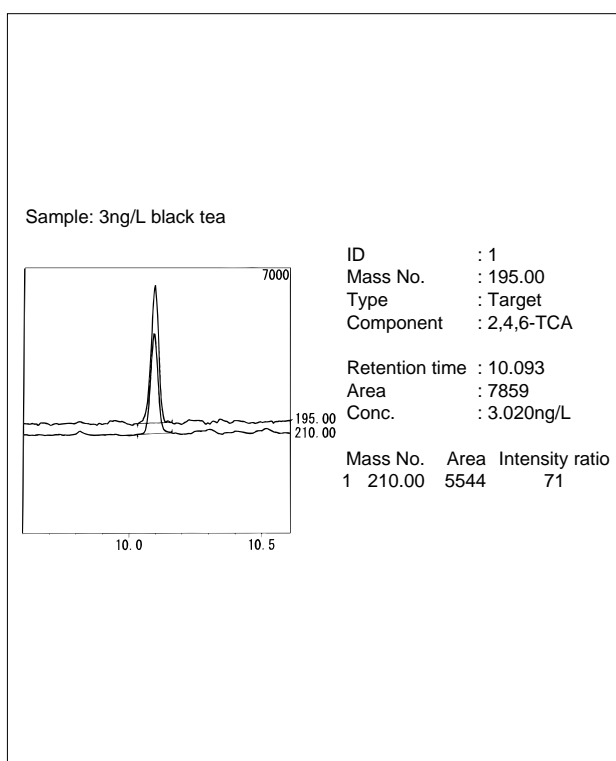


Fig. 4.12.6 Analysis of black tea (3ng/L added)