

1.5 Analysis of Musty Smelling Components in Tap Water (1) – Purge & Trap GC/MS

•Explanation

Japanese tap water has an established reputation in the area of quality as drinking water; however, in recent years, it has a musty odor depending on the season. And the substances that cause this musty odor are known to be 2-methylisoborneol and geosmin. The threshold value for the odors of these compounds is approximately 10ppt, which is low, and cannot be detected in source state by GC/MS analysis, so the purge trap method, as shown in the drinking water test method, is used to concentrate the compounds for analysis by GC/MS. This purge trap method involves forcing the targeted compound into a gas phase using aeration, holding this gas phase in a concentration tube filled with TENAX TA, then forcing out of the concentration tube by heating.

References

- (1) Drinking Water Test Method & Explanation, Japan Water Works Association volume
- (2) Environmental Water Analysis Manual, Environmental Science Research Group volume

•Analytical Conditions

P&T: Tekmer-Dohrmann LSC3000J

Trap tube : G1 (TENAX TA)
 Sample purge time : 11min
 Force out : 225°C, 8min

Shimadzu GCMS-QP5050A

Column : DB-1701 30m × 0.32mm
 I.D. 1μm(df)
 Column temperature : 60°C(3min)-10°C(min)
 240°C(10min)
 Carrier gas : He 40kPa

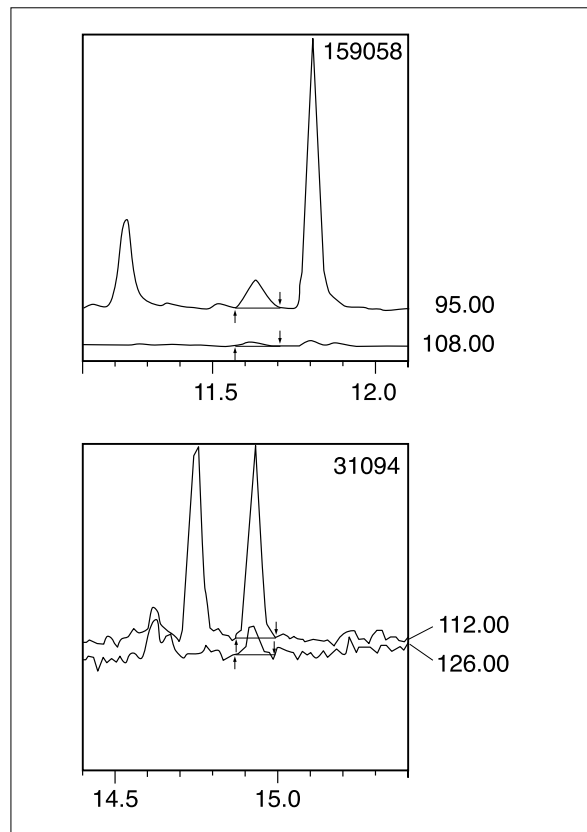


Fig. 6 Analysis example of musty odor 3.0ppt
 (Upper: 2-MIB, lower: geosmin)

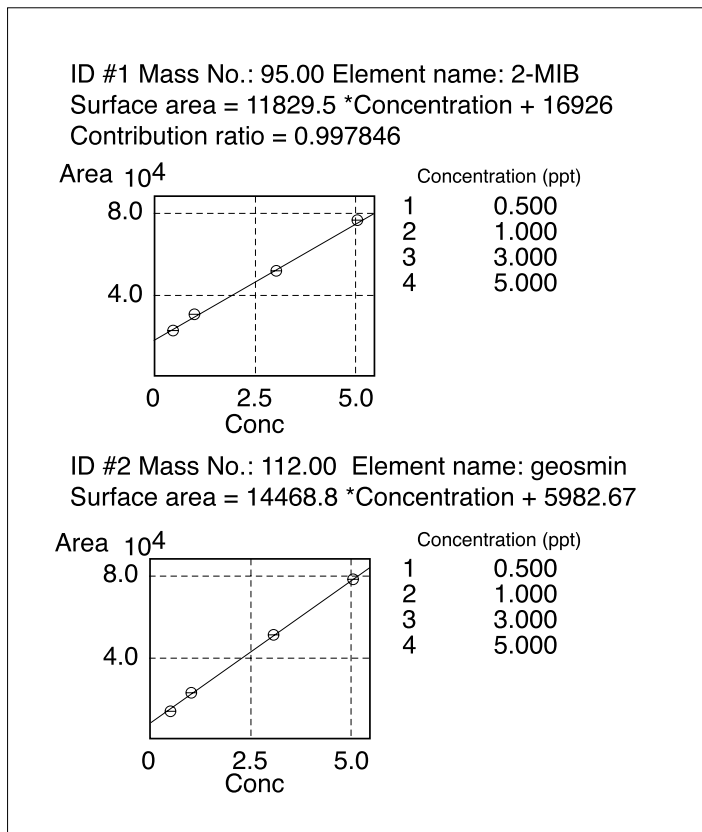
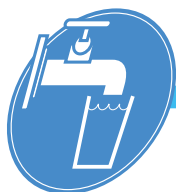


Fig. 7 Calibration curve
 (Upper: 2-MIB, lower: geosmin)



1.5 Analysis of Musty Smelling Components in Tap Water (2) – Purge & Trap GC/MS

Reference Example 1

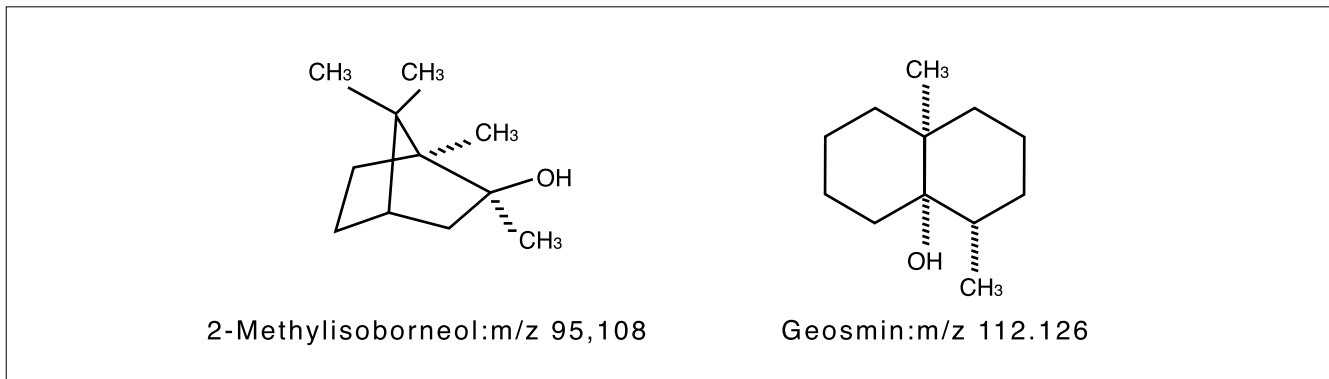


Fig. 8 Structures of 2-MIB and geosmin

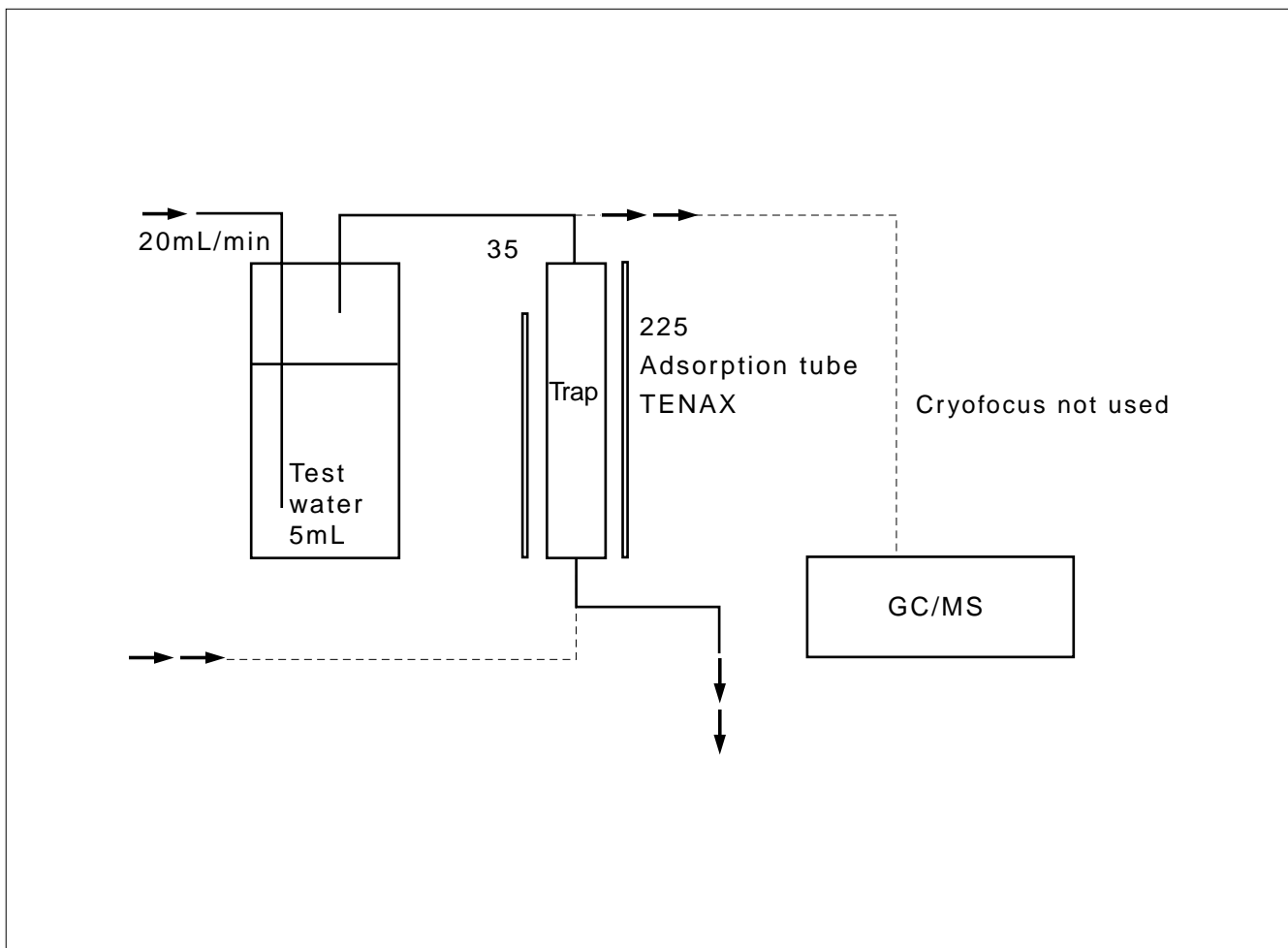


Fig. 9 Principle diagram of purge & trap method