

1.4 Analysis of Volatile Organic Compound (VOC) in Tap Water (1) – Purge & Trap GC/MS

•Explanation

The purge trap method involves purging volatile organic compound that exists in water using helium or nitrogen gas, holding it in a trap tube, then quickly heating it to induct it into a GC/MS column. Nearly all the volatile constituents included in a 5mL sample are concentrated in the trap tube to enable highly sensitive analysis.

Figure 4 is a SIM chromatograph of the 23 constituent compounds targeted and individual 0.1µg/L concentrations of p-bromofluorbenzene (IS). The chart 1 shows the names of the targeted compounds and the SIM selected ions.

References

- (1) Drinking Water Test Method & Explanation, Japan Water Works Association volume
- (2) Environmental Water Analysis Manual, Environmental Science Research Group volume
- (3) New Wastewater Standards and Other Analysis Methods, Environmental Science Research Group volume

•Analytical Conditions

P&T: Tekmer-Dohrmann LSC3000J (No cryofocus)
 Trap tube : GI (TENAX)
 Sample purge time: 6min
 Desorption : 225°C, 2min

Shimadzu GCMS-QP5050A

Column : DB-624 60m × 0.32mm I.D., 1.8µm (df)
 Column temperature: 40°C (1min)-10°C/min
 Carrier gas : He 100kPa

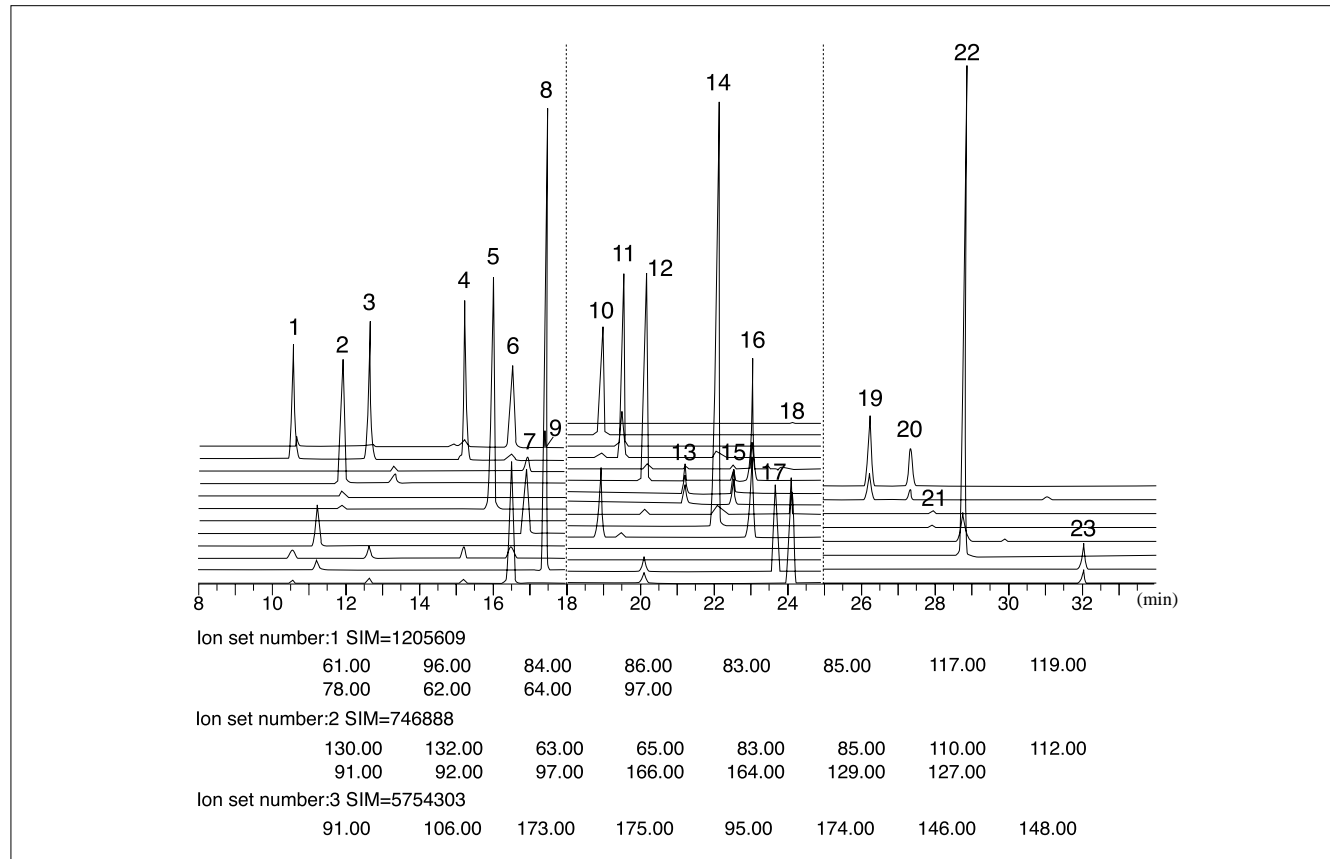
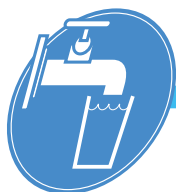


Fig. 4 Measuring example of 0.1 µg/L added water



1.4 Analysis of Volatile Organic Compound (VOC) in Tap Water (2) – Purge & Trap GC/MS

ID	Name	SIM Selected Ions	ID	Name	SIM Selected Ions
1	1,1-dichloroethene	96,61	13	cis-1,3-dichloropropene	75,110
2	Dichloromethane	84,86	14	Toluene	92,91
3	trans-1,2-dichloroethane	96,61	15	trans-1,3-dichloropropene	75,110
4	cis-1,2-dichloroethane	96,61	16	1,1,2-trichloroethene	97,99
5	Chloroform	83,85	17	Tetrachloroethene	166,164
6	1,1,1-trichloroethane	97,99	18	Dibromochloromethane	129,127
7	Tetrachloromethane	117,119	19	m,p-xylene	106,91
8	Benzene	78,77	20	o-xylene	106,91
9	1,2-dichloroethane	62,64	21	Bromoform	173,175
10	Trichloroethene	130,132	22	p-bromofluorbenzene(IS)	174,176
11	1,2-dichloropropane	63,62	23	p-dichlorobenzene	146,148
12	Bromodichloromethane	83,85			

Chart 1 SIM selected ions

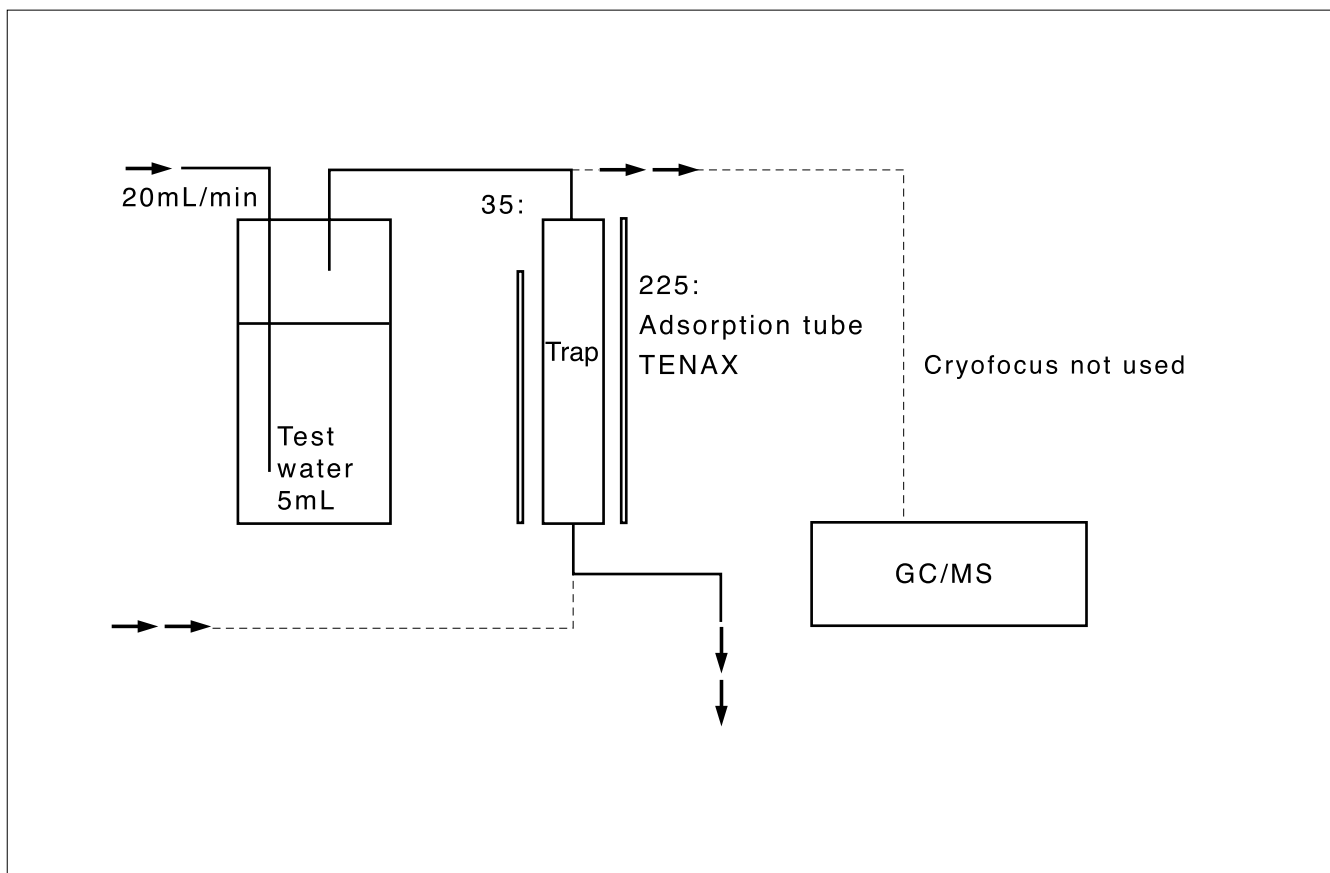


Fig. 5 Purge & trap GC/MS system