

2.26 Analysis of Volatile Organic Compound (VOC) in Wastewater and Environment Water using Head Space Method (1) – GC/MS

•Explanation

In addition to the amendments to the water quality standard in tap water in December 1992 and the environment standard for environment water suitable as a source of drinking water in March 1993, a further amendment was also implemented for the wastewater standard in February 1994. The analysis of the compounds itemized in these amendments is performed using the head space method, the solvent extraction method, and the purge trap method. Here, the head space method has the features of being easy to operate, has good reproducibility, an auto sampler can be used, and carry over (pollution levels of conventional analytical instruments caused by components with high concentration levels) is minimal.

References

Drinking Water Test Method & Explanation Japan Water Works Association volume
Environment Water Quality Analysis Manual
Environment Chemical Research Association volume
New wastewater standards and their analysis methods

•Analytical Conditions

Sample : 10ml+NaCl3g

Perkin Elmer HS-40

Sample temp. : 60°C

Condition time : 30min

Needle temp. : 120°C

Transfer temp. : 150°C

Pressuriz. time : 2min

Injection time : 0.20min

Shimadzu GCMS-QP5050A

Carrier gas : He120kPa

Column : DB624 60m × 0.32mm I.D.

1.8µm(df)

Column temp. : 40°C (2min)-10°C /min-200°C (2min)

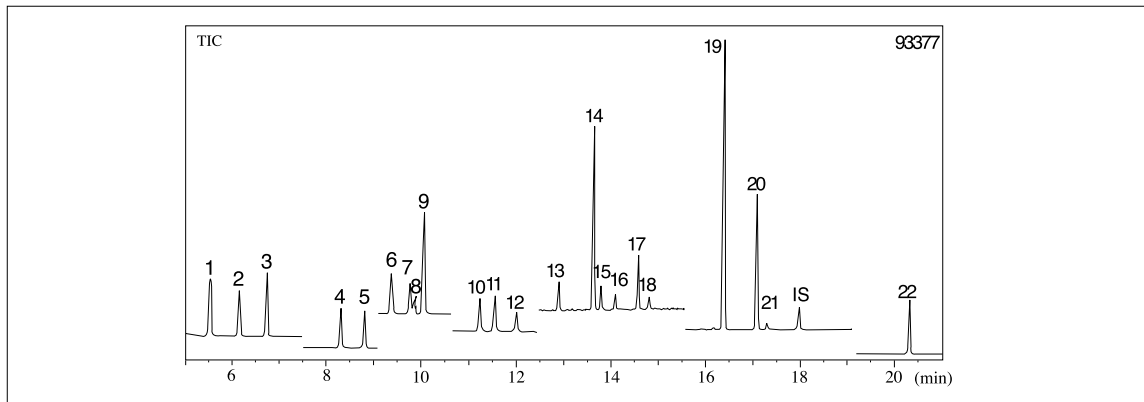


Fig. 61 Analysis example of standard sample (VOC 2ug/L)

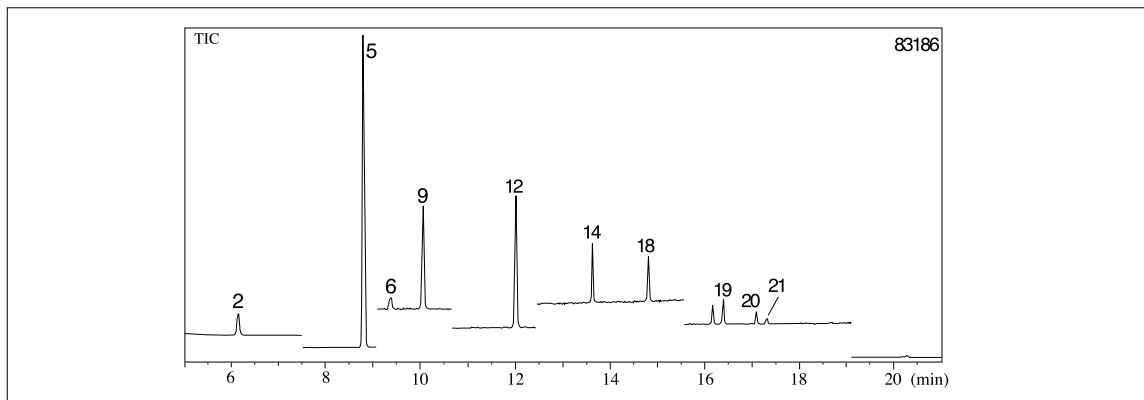


Fig. 62 Analysis example of tap water

2.26 Analysis of Volatile Organic Compound (VOC) in Wastewater and Environment Water using Head Space Method (2) – GC/MS

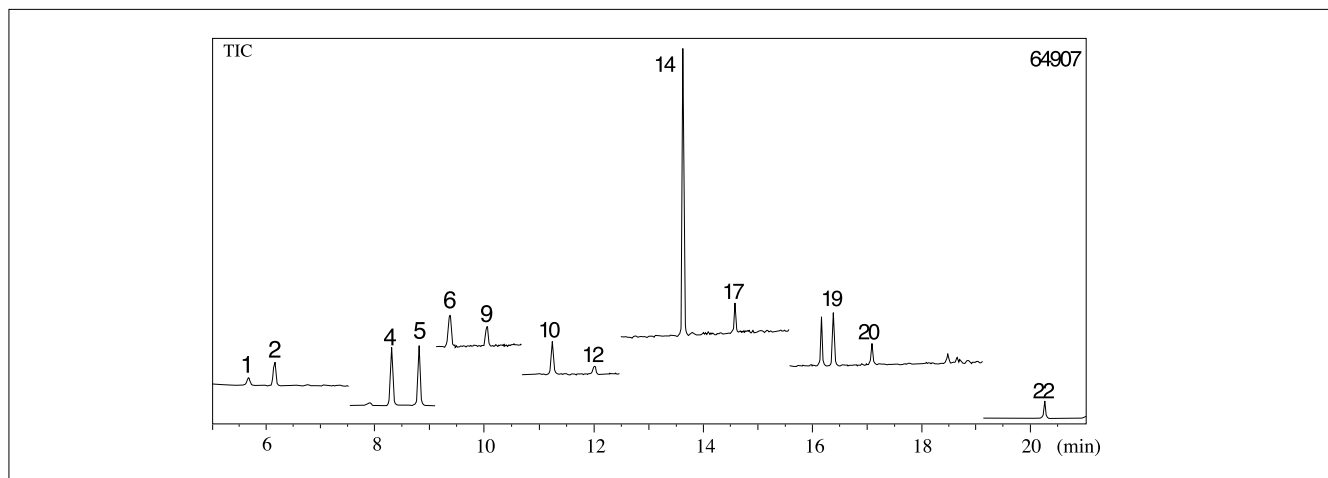


Fig. 63 Analysis example of wastewater

ID	Name	Tap Water (mg/L)	Environment Water (mg/L)	Soil (mg/L)	Wastewater, Sewage, Industrial waste (mg/L)
1	1,1-dichloroethene	0.02	Same as left	Same as left	0.2
2	Dichloromethane	0.02	Same as left	Same as left	0.2
3	trans-1,2-dichloroethane	0.04	Same as left	–	–
4	cis-1,2-dichloroethane	0.04	Same as left	Same as left	0.4
5	Chloroform	0.06	Same as left	–	–
6	1,1,1-trichloroethane	0.3	1.0	1.0	3.0
7	Tetrachloromethane	0.002	Same as left	Same as left	0.02
8	1,2-dichloroethane	0.004	Same as left	Same as left	0.04
9	Benzene	0.01	Same as left	Same as left	0.1
10	Trichloroethene	0.03	Same as left	Same as left	0.3
11	1,2-dichloropropane	0.06	Same as left	–	–
12	Bromodichloromethane	0.03	Same as left	–	–
13	cis-1,3-dichloropropene	*1	Same as left	Same as left	*3
14	Toluene	0.6	Same as left	–	–
15	trans-1,3-dichloropropene	*1	Same as left	Same as left	*3
16	1,1,2-trichloroethene	0.006	Same as left	Same as left	0.06
17	Tetrachloroethene	0.01	Same as left	Same as left	0.1
18	Dibromochloromethane	0.1	Same as left	–	–
19	m,p-xylene	*2	Same as left	–	–
20	o-xylene	*2	Same as left	–	–
21	Bromoform	0.09	Same as left	–	–
22	p-dichlorobenzene	0.3	Same as left	–	–
IS	p-bromofluorobenzene				

Chart 11 Names of measured target compounds together with standard values and indicator values

*1: Total 0.002mg/L

*2: Total 0.4mg/L

*3: Total 0.02mg/L

–: Not regulated