



Method Summary

Determination of Volatile Organic Compounds in Waters by Headspace/GC-MS

Scope and Range

This method is used for the detection, identification, and quantitation of 63 volatile organic compounds that have boiling points typically below 200° C. The analysis is conducted on a Gas Chromatograph system using a Mass Selective Detector (GC-MS).

This method is applicable to the analysis of waters and leachates.

The concentration range is from a maximum of 500 µg/l down to the reporting limits shown in the table below. Accreditation status is also shown in the table below.

Holding times for VOC compounds is between 10 and 21 days depending on the compound.

Compound	LOR (µg/l)	Landfill Leach	Untreated Sewage	Treated Sewage	Trade Effluent	Ground Water	Surface Water
1,1,1,2-Tetrachloroethane	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
1,1,1-Trichloroethane	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
1,1,2,2-Tetrachloroethane	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
1,1,2-Trichloroethane	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
1,1-Dichloroethane	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
1,1-Dichloroethene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
1,1-Dichloropropene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
1,2,3-Trichlorobenzene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
1,2,3-Trichloropropane	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
1,2,4-Trichlorobenzene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
1,2,4-Trimethylbenzene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
1,2-Dibromo-3-chloropropane	<1	-	-	-	-	-	-
1,2-Dibromoethane	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
1,2-Dichlorobenzene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
1,2-Dichloroethane	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
1,2-Dichloropropane	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
1,3,5-Trichlorobenzene	<1	-	-	-	-	-	-
1,3,5-Trimethylbenzene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
1,3-Dichlorobenzene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
1,3-Dichloropropane	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
1,4-Dichlorobenzene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
2,2-Dichloropropane	<1	-	-	-	-	-	-
2-Chlorotoluene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
4-Chlorotoluene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
4-iso-Propyltoluene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Benzene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Bromobenzene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Bromochloromethane	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Bromodichloromethane	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Bromoform	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Bromomethane	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Carbon disulphide	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Carbontetrachloride	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Chlorobenzene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Chloroethane	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Chloroform	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Chloromethane	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
cis-1,2-Dichloroethene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
cis-1,3-Dichloropropene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Dibromochloromethane	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Dibromomethane	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025



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Compound	LOR (µg/l)	Landfill Leach	Untreated Sewage	Treated Sewage	Trade Effluent	Ground Water	Surface Water
Dichlorodifluoromethane	<1	–	–	–	–	–	–
Dichloromethane	<3	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Ethylbenzene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Hexachlorobutadiene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Isopropylbenzene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Naphthalene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
n-Butylbenzene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
o-Xylene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
m,p-Xylene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Propylbenzene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
sec-Butylbenzene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Styrene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
tert-Amyl methyl ether (TAME)	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Methyl tertiary butyl ether (MTBE)	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
tert-Butylbenzene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Tetrachloroethene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Toluene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
trans-1,2-Dichloroethene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
trans-1,3-Dichloropropene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Trichloroethene	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Trichlorofluoromethane	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025
Vinyl chloride	<1	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025	ISO17025

References

Rapid Quantitation of VOCs in Soil and Water by HS-GC-MS. Chromatography Technical Note No.48, Anatune Ltd, UK.

USEPA Method No.624 'Method 624 - Purgables'.

USEPA Method No.8260b 'Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC-MS)'.

Determination of Volatile Organic Compounds by Headspace Trap. Barani et al. Journal of Chromatographic Science, Vol. 44, November/December 2006.

Principle

An aliquot of the sample is transferred to a headspace vial and heated/agitated to drive volatile analytes into the headspace of the vial. A portion of the headspace is transferred to a gas chromatograph where the compounds are separated and then detected by GC-MS.

Interferences

Compounds with retention times and ion spectra similar to the target compounds could interfere with the analysis.