



Method Summary

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

Scope and Range

This method is used for the detection, identification and quantitation of 64 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 soils.

The concentration range is from a maximum of 500 µg/kg down to the reporting limits shown in the table below. Accreditation status is also shown in the table below (methanolic extraction may be used to extend the reporting range but is unaccredited).

Holding times for VOC compounds is 14 days (7 days for Vinyl Chloride and Styrene).

Compound	LOD (µg/kg)	Accreditation status
Dichlorodifluoromethane	0.5	ISO 17025
Chloromethane	2	ISO 17025
Vinyl Chloride	0.5	MCERTS
Bromomethane	1	MCERTS
Chloroethane	1	MCERTS
Trichlorofluoromethane	0.5	MCERTS
1,1-Dichloroethene	0.5	ISO 17025
Carbon Disulphide	1	MCERTS
Dichloromethane	5	ISO 17025
tert-Butyl Methyl Ether	0.5	MCERTS
trans-1,2-Dichloroethene	1	MCERTS
1,1-Dichloroethane	0.5	MCERTS
cis-1,2-Dichloroethene	0.5	MCERTS
2,2-Dichloropropane	1	None
Bromochloromethane	2	MCERTS
Chloroform	3	MCERTS
1,1,1-Trichloroethane	0.5	MCERTS
1,1-Dichloropropene	0.5	MCERTS
Carbon Tetrachloride	0.5	MCERTS
1,2-Dichloroethane	1	MCERTS
Benzene	1	MCERTS
tert-Amyl Methyl Ether	1	ISO 17025
Trichloroethene	1	ISO 17025
1,2-Dichloropropane	0.5	MCERTS
Dibromomethane	1	MCERTS
Bromodichloromethane	2	MCERTS
cis-1,3-Dichloropropene	0.5	MCERTS
Toluene	1	MCERTS
trans-1,3-Dichloropropene	1	None
1,1,2-Trichloroethane	1	MCERTS
1,3-Dichloropropane	1	MCERTS
Tetrachloroethene	2	MCERTS
Dibromochloromethane	2	MCERTS
1,2-Dibromoethane	1	MCERTS
Chlorobenzene	2	MCERTS
1,1,1,2-Tetrachloroethane	1	MCERTS
Ethylbenzene	1	MCERTS
p/m-Xylene	2	ISO 17025
o-Xylene	2	MCERTS



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Styrene	2	ISO 17025
Bromoform	2	MCERTS
Isopropylbenzene	2	ISO 17025
1,1,2,2-Tetrachloroethane	2	ISO 17025
1,2,3-Trichloropropane	2	MCERTS
Bromobenzene	2	MCERTS
Propylbenzene	2	MCERTS
2-Chlorotoluene	3	MCERTS
1,3,5-Trimethylbenzene	2	MCERTS
4-Chlorotoluene	3	MCERTS
tert-Butylbenzene	2	ISO 17025
1,2,4-Trimethylbenzene	3	ISO 17025
sec-Butylbenzene	1	None
4-Isopropyltoluene	2	None
1,3-Dichlorobenzene	5	MCERTS
1,4-Dichlorobenzene	5	MCERTS
1,2-Dichlorobenzene	5	MCERTS
1,2-Dibromo-3-chloropropane	3	None
n-Butylbenzene	2	None
1,3,5-Trichlorobenzene	7	None
1,2,4-Trichlorobenzene	7	None
Hexachlorobutadiene	4	None
Naphthalene	8	MCERTS
1,2,3-Trichlorobenzene	10	ISO 17025

References

National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) Schedule B3.

USEPA Method No. 624.1 'Method 624.1 - Purgables'.

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

USEPA Method No. 5021A 'Volatile organic compounds in soils and other solid matrices Using equilibrium headspace analysis'

Principle

An aliquot of the sample is transferred to a headspace vial with water 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 detected by GC-MS.

Interferences

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