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BSI Standards Publication

Soil quality — Determination of some selected phenols and chlorophenols — Gas chromatographic method with mass spectrometric detection

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National foreword

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A list of organizations represented on this committee can be obtained on request to its secretary.

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Qualité du sol — Dosage de quelques phénols et chlorophénols sélectionnés — Méthode par chromatographie en phase gazeuse avec détection par spectrométrie de masse

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information.

The committee responsible for this document is ISO/TC 190, *Soil quality*, Subcommittee SC 3, *Chemical methods and soil characteristics*.

Soil quality — Determination of some selected phenols and chlorophenols — Gas chromatographic method with mass spectrometric detection

WARNING — Phenols and chlorophenols are both toxic and corrosive and should be handled with care. Methanol and acetonitrile are toxic and acetic acid is corrosive. Latex or nitrile gloves and eye protection should be worn at all times. Spills should immediately be wiped up with adsorbent tissue and placed in sealed containers used for the disposal of toxic chemicals. Samples should be treated as toxic and harmful. Extreme care shall be taken through all steps of the extraction procedure, which shall be performed in a fume hood. All solvent wastes shall be collected and treated as hazardous waste. Thus, there is a contamination risk in the laboratory.

1 Scope

This International Standard describes the gas chromatographic determination of phenols, methyl phenols, di-methylphenols and tri-methylphenols (see Table 1) and selected chlorophenols (see Table 2) by using mass spectrometric detection in soil samples. This method can also be used for other solid samples, such as sediments and solid wastes. This International Standard describes an acidic liquid extraction of soil, followed by acetylation and then liquid/liquid extraction. Determination takes place by gas chromatography and mass spectrometric detection.

With this method, phenols and chlorophenols can be determined at the lowest of mass concentrations ranging from approximately 0,01 mg/kg to 0,1 mg/kg depending on the component sensitivity and the quantity of sample used. In some cases, complete separation of isomers cannot be achieved. Then the sum is reported.

NOTE With this method, other higher methylated phenols can also be analysed provided that the suitability and the validity of the method is proven.

Table 1 — Target phenolic compounds with relevant mass fractions of respective acetylated compounds for MS-detection

Compound	CAS-RN[a]	Chemical formula	Acetylated compounds Fragmentation[b]			
			1st mass	Relative intensity %	2nd mass	Relative intensity %
phenol	108-95-2	C_6H_6O	94	100	66	26
2-methylphenol (o-cresol)	95-48-7	C_7H_8O	108	100	107	68
3-methylphenol (m-cresol)	108-39-4	C_7H_8O	108	100	107	85
4-methylphenol (p-cresol)	106-44-5	C_7H_8O	108	100	107	92
2,3-dimethylphenol	596-75-0	$C_8H_{10}O$	122	90	107	100
2,4-dimethylphenol	105-67-9	$C_8H_{10}O$	122	100	107	85
2,5-dimethylphenol	95-87-4	$C_8H_{10}O$	122	100	107	90
2,6-dimethylphenol	576-261-1	$C_8H_{10}O$	122	100	107	92

[a] Chemical abstract service registry number.

[b] Spectral database for organic compounds (SDBS).