International Standard

ISO 11265

Environmental solid matrices — Determination of the specific electrical conductivity

Matrices solides environnementales — Détermination de la conductivité électrique spécifique

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Contents

Page

Foreword ... **iv**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Principle ... **1**
5 Reagents ... **1**
6 Apparatus ... **2**
7 Laboratory sample ... **2**
8 Procedure ... **3**
8.1 Extraction ... 3
8.2 Checking of the cell constant ... 3
8.3 Measurement of the electrical conductivity of the filtrates ... 4
9 Interferences ... **4**
10 Repeatability ... **5**
11 Test report ... **5**
Annex A (informative) **Results of an interlaboratory trial for the determination of the specific electrical conductivity of soils** ... **6**
Bibliography ... **7**

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Foreword

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This document was prepared by Technical Committee ISO/TC 190, *Soil quality*, Subcommittee SC 3, *Chemical and physical characterization,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 444, *Environmental characterization of solid matrices,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 11265:1994), which has been technically revised. It also incorporates the Technical Corrigendum ISO 11265:1994/Cor 1:1996.

The main changes are as follows:

— change of temperature criteria during extraction;

— the distinction between solid and sludge-like matrices is added.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Environmental solid matrices — Determination of the specific electrical conductivity

1 Scope

This document specifies an instrumental method for the routine determination of the specific electrical conductivity in an aqueous extract of soil, sludge, biowaste or waste. The determination is carried out to obtain an indication of the content of water-soluble electrolytes in a sample.

This document is applicable to all types of air-dried samples of soil, sludge, biowaste and waste.

2 Normative references

The following documents are referred to in the text in such a way that some or all their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 11464, *Soil quality — Pretreatment of samples for physico-chemical analysis*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Principle

Air-dried solids are extracted with water at (22 ± 3) °C at an extraction ratio of 1:5 (m/V), to dissolve the electrolytes. The specific electrical conductivity of the extract or fresh liquid sludge is measured, and the result is corrected to a temperature of 25 °C.

NOTE For definitions of the concepts used, see ISO 7888.

5 Reagents

Use only reagents of recognized analytical grade.

5.1 Water, demineralized, with a specific electrical conductivity not higher than 0,2 mS/m at 25 °C.

5.2 Potassium chloride solution, c(KCl) = 0,1 mol/l.

Dissolve 7,456 g of potassium chloride, previously dried for 2 h at (105 ± 5) °C in water (5.1), and dilute to 1 000 ml at 20 °C. The specific electrical conductivity of this solution is 1 288 mS/m at 25 °C.

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5.3 Potassium chloride solution, c(KCl) = 0,020 0 mol/l.

Pour 200,0 ml of the potassium chloride solution (5.2) into a 1 000 ml volumetric flask and dilute to volume with water at 20 °C. The specific electrical conductivity of this solution is 277 mS/m at 25 °C.

5.4 Potassium chloride solution, c(KCl) = 0,010 0 mol/l.

Pour 100,0 ml of the potassium chloride solution (5.2) into a 1 000 ml volumetric flask and dilute to volume with water at 20 °C. The specific electrical conductivity of this solution is 141 mS/m at 25 °C.

All the potassium chloride solutions (5.2, 5.3 and above) used for calibration shall be stored in tightly sealed bottles which do not release sufficient alkali or alkali-earth cations to affect the electrical conductivity of the solutions.

NOTE 1 Plastics bottles can be suitable.

NOTE 2 For bottles containing potassium chloride solutions, plastics seals can lead to welding of the glass to the bottle.

NOTE 3 Commercially available conductivity standards can be used.

6 Apparatus

6.1 Conductivity meter, fitted with a conductivity cell, equipped with an adjustable measuring range setting and (automatic) temperature correction and having an accuracy of 1 mS/m at 20 °C. Preferably, the conductivity meter should also be equipped with a cell-constant control.

6.2 Analytical balance, with an accuracy of at least 0,01 g.

6.3 Thermometer, capable of measuring to the nearest 0,1 °C.

6.4 Shaking machine, with a horizontal movement sufficiently vigorous to produce and maintain a 1:5 soil:water suspension, placed in an environment where the temperature adjusted is maintained at (22 ± 3) °C.

NOTE Machines with a speed of about 180 cycles per minute and a stroke of about 5 cm are suitable.

6.5 Filter paper, with low ash and high retentive properties.

6.6 Shaking bottle, of capacity 250 ml, made of plastics (e.g. polyethylene or polypropylene).

NOTE Borosilicate glass bottles can be used.

6.7 Usual laboratory glassware.

7 Laboratory sample

This determination can be performed on dried and un-dried samples.

Pretreat samples in such way that a representative subsample can be taken.

NOTE Guidance is given in ISO 11464, EN 15002 or EN 16179 as appropriate. For biowaste samples with particles > 10 mm guidance is given in EN 13038.

Use the fraction of particles smaller than 2 mm of air-dried soil samples pretreated according to ISO 11464.

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