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Standards

Standard Recommendation
S.R. CEN ISO/TS 21268-4:2009

Soil quality - Leaching procedures for subsequent chemical and ecotoxicological testing of soil and soil materials - Part 4: Influence of pH on leaching with initial acid/base addition (ISO/TS 21268-4:2007)

S.R. CEN ISO/TS 21268-4:2009

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Soil quality - Leaching procedures for subsequent chemical and ecotoxicological testing of soil and soil materials - Part 4: Influence of pH on leaching with initial acid/base addition (ISO/TS 21268-4:2007)

Qualité du sol - Modes opératoires de lixiviation en vue d'essais chimiques et écotoxicologiques ultérieurs des sols et matériaux du sol - Partie 4: Essai de dépendance au pH avec ajout initial d'acide/base (ISO/TS 21268-4:2007)

Bodenbeschaffenheit - Eluierungsverfahren für die anschließende chemische und ökotoxikologische Untersuchung von Boden und von Bodenmaterialien - Teil 4: Einfluss des pH-Wertes unter vorheriger Säure/Base-Zugabe (ISO/TS 21268-4:2007)

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Foreword

The text of ISO/TS 21268-4:2007 has been prepared by Technical Committee ISO/TC 190 “Soil quality” of the International Organization for Standardization (ISO) and has been taken over as CEN ISO/TS 21268-4:2009 by Technical Committee CEN/TC 345 “Characterization of soils” the secretariat of which is held by NEN.

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The text of ISO/TS 21268-4:2007 has been approved by CEN as a CEN ISO/TS 21268-4:2009 without any modification.

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**Soil quality — Leaching procedures
for subsequent chemical
and ecotoxicological testing of soil
and soil materials —**

Part 4:

**Influence of pH on leaching with initial
acid/base addition**

*Qualité du sol — Modes opératoires de lixiviation en vue d'essais
chimiques et écotoxicologiques ultérieurs des sols et matériaux du
sol —*

Partie 4: Essai de dépendance au pH avec ajout initial d'acide/base



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of document:

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An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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ISO/TS 21268-4 was prepared by Technical Committee ISO/TC 190, *Soil quality*, Subcommittee SC 7, *Soil and site assessment*.

ISO/TS 21268 consists of the following parts, under the general title *Soil quality — Leaching procedures for subsequent chemical and ecotoxicological testing of soil and soil materials*:

- *Part 1: Batch test using a liquid to solid ratio of 2 l/kg dry matter*
- *Part 2: Batch test using a liquid to solid ratio of 10 l/kg dry matter*
- *Part 3: Up-flow percolation test*
- *Part 4: Influence of pH on leaching with initial acid/base addition*

Introduction

In various countries, tests have been developed to characterize and assess the constituents that can be released from materials. The release of soluble constituents upon contact with water is regarded as a main mechanism of release, resulting in a potential risk to the environment during the use or disposal of materials. The intent of these tests is to identify the leaching properties of materials. The complexity of the leaching process makes simplifications necessary.

Not all of the relevant aspects of leaching behaviour can be addressed in one standard.

Tests to characterize the behaviour of materials can generally be divided into three categories (see References [1], [2] and [4]). The relationships between these tests are summarized below.

- a) "Basic characterization" tests are used to obtain information on the short- and long-term leaching behaviour and characteristic properties of materials. Liquid/solid (L/S) ratios, leachant composition, factors controlling leachability, such as pH, redox potential, complexing capacity, role of dissolved organic carbon (DOC), ageing of material and physical parameters, are addressed in these defined tests.
- b) "Compliance" tests are used to determine whether the material complies with a specific behaviour or with specific reference values. These tests focus on key variables and leaching behaviour previously identified by basic characterization tests.
- c) "On-site verification" tests are used as a rapid check to confirm that the material is the same as that which has been subjected to the compliance test(s). On-site verification tests are not necessarily leaching tests.

The test procedure described in this method belongs to category a) "Basic characterization" tests.

NOTE Up to now, the test procedures described in this part of ISO/TS 21268 have not been validated.

Soil quality — Leaching procedures for subsequent chemical and ecotoxicological testing of soil and soil materials —

Part 4: Influence of pH on leaching with initial acid/base addition

1 Scope

This part of ISO/TS 21268 specifies a test method to obtain information on the short- and long-term leaching behaviour and characteristic properties of materials.

It applies to the determination of the influence of pH on the leachability of inorganic and organic constituents from soil and soil material, and the ecotoxicological effects of eluates with respect to microorganisms, fauna and flora. The test is not suitable for constituents that are volatile under ambient conditions. The equilibrium condition, as defined in this part of ISO/TS 21268, is established by the addition of predetermined amounts of acid or base to reach desired final pH values.

The test procedure specified in this part of ISO/TS 21268 produces eluates that are subsequently characterized by physical, chemical and ecotoxicological standard methods.

For the purposes of ecotoxicological tests, the relevant pH range (see 9.2) will usually be pH 5 to 9.

NOTE 1 Volatile organic constituents include the low molecular weight components in mixtures such as mineral oil.

NOTE 2 It is not always possible to optimize test conditions simultaneously for inorganic and organic constituents and optimum test conditions may also vary between different groups of organic constituents. Test requirements for organic constituents are generally more stringent than those for inorganic constituents. The test conditions suitable for measuring the release of organic constituents will generally also be applicable to inorganic constituents.

NOTE 3 For ecotoxicological testing, eluates representing the release of both inorganic and organic contaminants are needed. In this document, ecotoxicological testing is meant to include genotoxicological testing.

This test cannot be used alone to determine the total leaching behaviour of a soil. More leaching tests are needed for that extended goal. This part of ISO/TS 21268 does not address issues related to health and safety. It only determines the leaching properties outlined in Clause 5.

2 Normative references

The following referenced documents are indispensable for the application 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 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 5667-3, *Water quality — Sampling — Part 3: Guidance on the preservation and handling of water samples*

ISO 7027, *Water quality — Determination of turbidity*

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