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Characterization of waste - Leaching behaviour tests - Influence of pH on leaching with continuous pH-control

Caractérisation des déchets - Essais de comportement à la lixiviation - Influence du pH sur la lixiviation avec contrôle continu du pH

Charakterisierung von Abfällen - Untersuchung des Auslaugungsverhaltens - Einfluss des pH-Wertes auf die Auslaugung bei kontinuierlicher pH-Wert-Kontrolle

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Foreword

This document (CEN/TS 14997:2006) has been prepared by Technical Committee CEN/TC 292 “Characterization of waste”, the secretariat of which is held by NEN.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, B, C or D, which is an integral part of this document.

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Introduction

This document has been developed primarily to support the requirements for leaching behaviour testing within EU and EFTA countries. Tests to characterize the behaviour of waste materials can generally be divided into three categories. The relationship between these tests is summarized below:

a) “Basic characterization“ tests are used to obtain information on the short and long term leaching behaviour and characteristic properties of waste materials. Liquid/solid (*L*/*S*) ratios, leachant composition, factors controlling leachability such as pH, redox potential, complexing capacity, ageing of waste and physical parameters are addressed in these tests.

b) “Compliance“ tests are used to determine whether the waste complies with a specific behaviour or with specific reference values. The 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 waste 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 specified in this document belongs to category (a): basic characterization tests.

In the test described in this standard an equilibrium condition is established as a result of continuous adjustment of pH. Size reduction is performed to accelerate reaching of equilibrium condition.

This test is different from the "Influence of pH on leaching with initial acid/base addition " (see CEN/TS 14429) in which the pH is controlled by addition of pre-determined amounts of acid or base to reach desired end pH values. The test is aiming at approaching equilibrium at the end of the procedure.

NOTE In Annex B specific uses of both the pH dependence test with initial acid/ base addition and the pH dependence test with continuous pH control are indicated.

1 Scope

This document specifies a test method for the determination of the influence of pH on the leachability of inorganic constituents from a waste material. Equilibrium condition as defined in the document is established by continuous adjustment of the pH by addition of acid or base to reach desired pH values. This test method produces eluates, which are subsequently characterized physically and chemically.

This document is a parameter specific test as specified in EN 12920. The application of this test method alone is not sufficient for the determination of the detailed leaching behaviour of a waste under specified conditions.

NOTE This generally requires the application of several test methods, behavioural modelling and model validation as specified in EN 12920.

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.

EN 12506, *Characterization of waste – Analysis of eluates - Determination of pH, As, Ba, Cd, Cl, Co, Cr, Cr VI, Cu, Mo, Ni, NO_2^-, Pb, total S, SO_4^{2-}, V and Zn*

EN 13370, *Characterization of waste – Analysis of eluates – Determination of Ammonium-N, AOX, conductivity, Hg, phenol index, TOC, $CN^-_{easily\ liberable}$, F^-*

EN 14346, *Characterization of waste – Calculation of dry matter by determination of dry residue or water content*

EN 14899, *Characterisation of waste – Sampling of waste materials – Framework for the preparation and application of a Sampling Plan*

EN 15002, *Characterization of waste – Preparation of test portions from the laboratory sample*

EN ISO 5667-3, *Water quality – Sampling – Part 3: Guidance on the preservation and handling of water samples (ISO 5667-3:2003)*

EN ISO 3696:1995 *Water for analytical laboratory use – Specification and test methods (ISO 3696:1987)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
dry residue of the sample
w_{dr}
remaining mass fraction of a sample after a drying process at 105 °C

[EN 14346]

3.2
eluate
solution obtained by a laboratory leaching test