

ICS 13.030.01

English Version

Characterization of waste - Leaching behaviour tests - Influence of pH on leaching with initial acid/base addition

Caractérisation des déchets - Essais de comportement à la lixiviation - Influence du pH sur la lixiviation avec ajout initial d'acide/base

Charakterisierung von Abfällen - Untersuchung des Auslaugungsverhaltens - Einfluss des pH-Wertes unter vorheriger Säure/Base Zugabe

This Technical Specification (CEN/TS) was approved by CEN on 11 February 2005 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

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Foreword

This CEN Technical Specification (CEN/TS 14429:2005) has been prepared by Technical Committee CEN/TC 292 "Characterisation of waste", the secretariat of which is held by NEN.

The annexes A, B, C and D are informative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this CEN Technical Specification: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

This Technical Specification 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 are summarized below:

1. "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.
2. "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.
3. "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 described in this Technical Specification belongs to category (1): basic characterization tests.

In the test, which is described in this Technical Specification equilibrium condition is established at different pH values as a result of the reaction between pre-selected amounts of acid or base and test portions of the waste material. Size reduction is performed to accelerate reaching of equilibrium condition.

This test is different from the "pH dependence test with continuous pH control" (pH static test see prEN 14997) in which the pH is controlled at pre-selected values over the entire testing period by continuous measurement and automatic addition of acid or base. 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 Technical Specification is applicable to determine the influence of pH on the leachability of inorganic constituents from a waste material. Equilibrium condition as defined in the standard is established by addition of pre-determined amounts of acid or base to reach desired end pH values. This test method produces eluates, which are subsequently characterized physically and chemically.

This Technical Specification is a parameter specific test as specified in ENV 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 ENV 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 12506:2003, *Characterization of waste – Analysis of eluates – Determination of pH, As, Ba, Cd, Cl-, Co, Cr, CrVI, Cu, Mo, Ni, NO2-, Pb, total S, SO42- and Zn.*

ENV 12920, *Characterization of waste – Methodology for the determination of the leaching behaviour of waste under specified conditions.*

EN 13370, *Characterization of waste – Analysis of eluates – Determination of Ammonium, AOX, conductivity, Hg, phenol index, TOC, easily liberatable CN, F.*

prEN 14346:2002, *Characterization of waste – Calculation of dry matter by determination of dry residue and water content.*

prEN 14899, *Characterization of waste — Sampling of waste materials - Framework for the preparation and application of a Sampling Plan.*

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

3 Terms and definitions

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

3.1

dry residue

W_{dr}

remaining mass fraction of a sample after a drying process at 105 °C

[prEN 14346:2002]

3.2

eluate

solution obtained by a laboratory leaching test

3.3

equilibrium condition

condition achieved when the pH deviation during a checking period at the last 4 hours of the test is below 0,3 pH unit