BS EN ISO 12782-2:2012

BSI Standards Publication

Soil quality — Parameters for geochemical modelling of leaching and speciation of constituents in soils and materials

Part 2: Extraction of crystalline iron oxides and hydroxides with dithionite

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

raising standards worldwide™

Documents
Document Sharing Hub

National foreword

This British Standard is the UK implementation of EN ISO 12782-2:2012.

The UK participation in its preparation was entrusted to Technical Committee EH/4, Soil quality.

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2012. Published by BSI Standards Limited 2012

ISBN 978 0 580 66912 5

ICS 13.080.05

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 June 2012.

Amendments issued since publication

Date	Text affected

Documents
Document Sharing Hub

Full document details: BS EN ISO 12782-2:2012

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 12782-2

June 2012

ICS 13.080.05

English Version

Soil quality - Parameters for geochemical modelling of leaching and speciation of constituents in soils and materials - Part 2: Extraction of crystalline iron oxides and hydroxides with dithionite (ISO 12782-2:2012)

Qualité du sol - Paramètres pour la modélisation géochimique de la lixiviation et de la spéciation des constituants des sols et des matériaux - Partie 2: Extraction des oxydes et hydroxydes de fer cristallin avec le dithionite (ISO 12782-2:2012)

Bodenbeschaffenheit - Parameter zur geochemischen Modellierung der Elution und Speziation von Bestandteilen in Böden und Materialien - Teil 2: Extraktion von Eisenoxiden und -hydroxiden mittels Dithionit (ISO 12782-2:2012)

This European Standard was approved by CEN on 31 May 2012.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

© 2012 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. EN ISO 12782-2:2012: E

Documents
Document Sharing Hub

Full document details: BS EN ISO 12782-2:2012

Foreword

This document (EN ISO 12782-2:2012) has been prepared by Technical Committee ISO/TC 190 "Soil quality" in collaboration with Technical Committee CEN/TC 345 “Characterization of soils” the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2012, and conflicting national standards shall be withdrawn at the latest by December 2012.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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

Endorsement notice

The text of ISO 12782-2:2012 has been approved by CEN as a EN ISO 12782-2:2012 without any modification.

Documents
Document Sharing Hub

Full document details: BS EN ISO 12782-2:2012

Contents

Page

Foreword ... iv
Introduction ... v
1 Scope ... 1
2 Normative references ... 1
3 Terms and definitions ... 2
4 Principle ... 2
5 Apparatus ... 3
6 Reagents ... 3
7 Sample pretreatment ... 4
7.1 Sample size ... 4
7.2 Particle size reduction ... 4
7.3 Determination of the water content ... 5
8 Procedure ... 5
8.1 Preparation of the extraction solution ... 5
8.2 Extraction ... 5
8.3 Analytical determination ... 5
9 Calculation ... 6
10 Expression of results ... 6
11 Test report ... 6
Annex A (informative) **Conditions regarding centrifugation** ... 7
Bibliography ... 10

© ISO 2012 – All rights reserved

Documents
Document Sharing Hub
Full document details: BS EN ISO 12782-2:2012

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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 12782-2 was prepared by Technical Committee ISO/TC 190, *Soil quality*, Subcommittee SC 7, *Soil and site assessment*.

ISO 12782 consists of the following parts, under the general title *Soil quality — Parameters for geochemical modelling of leaching and speciation of constituents in soils and materials*:

— *Part 1: Extraction of amorphous iron oxides and hydroxides with ascorbic acid*

— *Part 2: Extraction of crystalline iron oxides and hydroxides with dithionite*

— *Part 3: Extraction of aluminium oxides and hydroxides with ammonium oxalate/oxalic acid*

— *Part 4: Extraction of humic substances from solid samples*

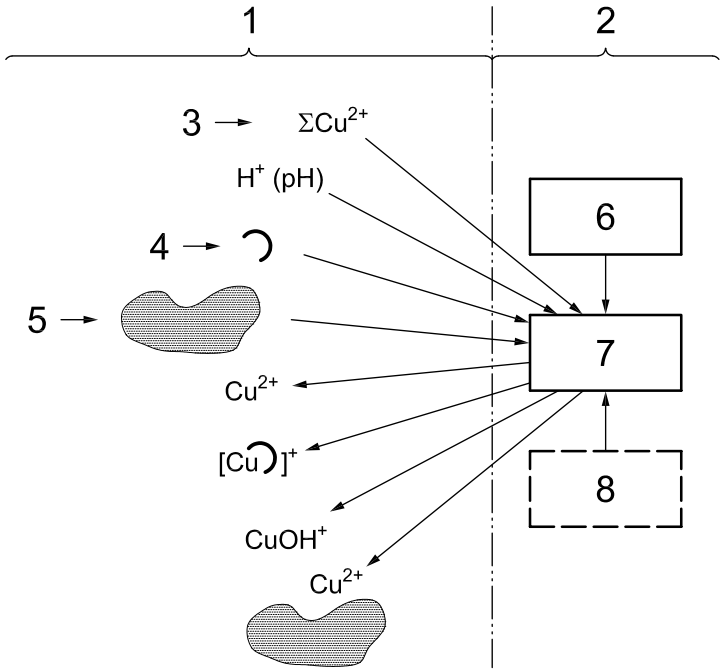
— *Part 5: Extraction of humic substances from aqueous samples*

© ISO 2012 – All rights reserved
Documents
Document Sharing Hub
Full document details: BS EN ISO 12782-2:2012

Introduction

In addition to leaching procedures for subsequent chemical and ecotoxicological testing of soil and other materials including waste, predictive models are becoming indispensable tools in the environmental risk assessment of these materials. Models are particularly required when the results of laboratory leaching tests are to be translated to specific scenarios in the field, with regard to assessing the risks of both contaminant migration and bioavailability.

In the past few years, geochemical models have been shown to be valuable tools to be combined with the data obtained from characterization leaching standards, such as pH-dependence and percolation tests. These models have the advantage of being based on fundamental thermodynamic parameters that have general validity. In order to enable extrapolation of laboratory leaching data to the mobility and/or bioavailability of a constituent in a specific field scenario, these models require additional input parameters for specific soil properties (see Figure 1).



Key

1 experiment
2 geochemical speciation modelling
3 available metal concentration
4 dissolved humic substances
5 reactive (solid) surfaces
6 database with stability constants
7 computer program
8 assumptions

Figure 1 — Relationships between experimental data, as obtained from laboratory leaching/extraction tests, and geochemical modelling of the speciation of a heavy metal in the environment (modified after M. Gfeller & R. Schulin, ETH, Zürich)

Characterization leaching standards provide information on the concentrations of the contaminant of interest as a function of, in particular, pH and liquid/solid (L/S) ratio. In addition, a more complete analysis of the leachates also provides information on the major ion composition and dissolved organic carbon (DOC), parameters that are particularly important for the chemical speciation of constituents through processes such as precipitation, complexation and competition for adsorption on reactive mineral and organic surfaces in the soil. As illustrated

© ISO 2012 – All rights reserved

AVA Documents
Document Sharing Hub
Full document details: BS EN ISO 12782-2:2012