

Soil quality —

Part 1: Terminology and classification —

Section 1.1 Terms and definitions relating to the protection and pollution of soil

ICS 01.040.13; 13.080

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee EH/4, Soil quality, upon which the following bodies were represented:

- Association of Consulting Scientists
- Association of Environmental Consultancies
- Association of Geotechnical and Geoenvironmental Specialists
- Association of Public Analysts
- British Gas plc
- British Society of Soil Science
- Chartered Institute of Environmental Health
- Chartered Institution of Water and Environmental Management
- Chemical Industries Association
- Department of the Environment (Water and Land Directorate)
- Department of the Environment (Building Research Establishment)
- Environment Agency
- Institute of Groundsmanship
- Institute of Terrestrial Ecology
- Laboratory of the Government Chemist
- Macaulay Land Use Research Institute
- Ministry of Agriculture, Fisheries and Food
- Society of Chemical Industry
- Soil Survey and Land Research Centre
- Water Research Centre
- Water Services Association of England and Wales

This British Standard, having been prepared under the direction of the Health and Environment Sector Board, was published under the authority of the Standards Board and comes into effect on 15 February 1997

© BSI 12-1998

The following BSI references relate to the work on this standard:
Committee reference EH/4
Draft for comment 93/504584 DC

ISBN 0 580 26920 5

Amendments issued since publication

Amd. No.	Date	Comments

Contents

	Page
Committees responsible	Inside front cover
National foreword	ii
Introduction	1
Scope	2
Normative reference	2
1 Terms relating to properties of soils and substances	3
2 Terms relating to processes in soils	7
3 Terms relating to the quality of soils	9
4 Terms relating to soil protection	13
5 Additional terms	15
List of references	Inside back cover

National foreword

This British Standard has been prepared by Technical Committee EH/4 and is identical with ISO 11074-1 *Soil quality — Vocabulary — Part 1: Terms and definitions relating to the protection and pollution of soil*, published by the International Organization for Standardization (ISO).

ISO 11074-1 was prepared by Subcommittee 1, Evaluation of criteria, terminology and codification, of Technical Committee ISO/TC 190, Soil quality, with the active participation and approval of the UK.

BS 7755 is being published in a series of Parts subdivided into Sections and Subsections that will generally correspond to particular international standards. Other Parts of BS 7755 are, or will be, as follows.

- *Part 1: Terminology and classification;*
- *Part 2: Sampling;*
- *Part 3: Chemical methods;*
- *Part 4: Biological methods;*
- *Part 5: Physical methods.*

For ease of production some of the French, Russian and German versions of the text have been retained.

Cross-reference

Publication referred to	Corresponding British Standard
ISO 6107-6:1986 ^a	BS 6068 <i>Water quality</i> Section 1.6:1996 <i>An additional 41 terms</i> (Identical)

^a Superseded by ISO 6107-6:1996.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 22, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Introduction

The assessment of the quality of a soil is a complex matter in view of the variety of uses, hazards and changes of soils. ISO/TC 190 has decided to give priority to two aspects:

- the quality of the environment (including water) in which the soil plays an essential part;
- the quality of the medium for agricultural production provided by the soil.

Given the importance attached to the problems of widespread or localized hazardous substances, erosion, compaction and other problems associated with agricultural production, it is essential to clearly establish defined concepts and common terminology to describe soils.

In this part of ISO 11074, most of the terms that are defined describe changes in the chemical composition of the soil and the effects of such changes on soil functions. Where feasible, attention has also been paid to physical and biological changes.

There are several possible definitions of the term soil. For the purposes of this part of ISO 11074, soil is the upper layer of the Earth's crust composed of mineral particles, organic matter, water, air and organisms.

In the context of soil protection, attention must be paid to topsoil, subsoil and deeper layers, and to associated mineral deposits and ground water.

Attention must also be paid to the presence, within or on the soil, of man-made materials such as domestic and industrial wastes, sludges, dredged materials and mine tailings. They may provide a source of substances hazardous to soil and affecting neighbouring natural soils. Soil processes take place in these man-made materials in the same way as they do in natural bedrock and surface deposits.

It should also be noted that construction activities frequently require the excavation and redeposition (translocation) of natural soils.

Soil functions describe the role of soils for man and the environment. Important soil functions include

- controlling element and energy cycles as a compartment of eco-systems;
- supporting plants, animals and man;
- giving support to man's constructions and buildings;
- agricultural production;
- bearing ground water and deposits;
- holding a genetic reservoir;
- serving as an archive of natural history;
- serving as an archaeological and paleo-ecological archive.

In addition, man uses soils for the deposition of man-made materials (see above), and atmospheric and water-borne pollutants can accumulate in soils.

This part of ISO 11074 is concerned with soil pollution. Technical Committee ISO/TC 190 found it particularly difficult to agree upon definitions for terms such as pollution and contamination.

Technical Committee ISO/TC 190 recognizes the importance of distinguishing between different states of soils bearing potentially hazardous substances.

In practice, the concentration of substance in soil may be

- a) at background level; or
- b) above background concentration because of anthropogenic influences.

With increasing concentration

- 1) a concentration is reached which may cause an adverse effect on specified soil function; and
- 2) finally the soil can be considered as a damaged soil.

High concentrations of a substance may also occur naturally and these may also cause adverse effects on soil functions.

The terms pollution and contamination and their equivalents in other languages have been applied to the conditions b), 1) and 2) respectively, with little consistency within and between countries. Different professionals or expert groups and responsible authorities use them in different contexts and in different ways. Sometimes they are treated as synonyms and sometimes attempts are made to confine the use to only a restricted sense. They are used in describing the process and in stating the quality of a soil.

Technical Committee ISO/TC 190 has therefore avoided definitions of the terms contamination and pollution, but instead emphasizes that those using them should make it clear what they intend by the use of these terms.

Scope

This part of ISO 11074 defines a list of terms used in certain fields of soil quality characterization. It covers terms relating to soil protection and pollution, and some miscellaneous terms.

NOTE In addition to the terms and definitions in the three official ISO languages (English, French and Russian), this part of ISO 11074 gives the equivalent terms and their definitions in the German language; these have been included at the request of Technical Committee ISO/TC 190 and are published under the responsibility of the member bodies of Germany (DIN), Austria (ON) and Switzerland (SNV). However, only the terms and definitions in the official languages can be considered as ISO terms and definitions.

Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 11074. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 11074 are encouraged to investigate the possibility of applying

the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 6107-6:1986, *Water quality — Vocabulary — Part 6*.

Domaine d'application

La présente partie de l'ISO 11074 définit une liste de termes employés dans certains domaines de la caractérisation de la qualité du sol. Elle recouvre les termes relatifs à la protection et à la pollution des sols, et quelques termes divers.

NOTE En complément des termes et définitions utilisés dans les trois langues officielles de l'ISO (anglais, français, russe), la présente partie de l'ISO 11074 donne les termes équivalents et leurs définitions en allemand; ils ont été inclus à la demande du comité technique ISO/TC 190 et sont publiés sous la responsabilité des comités membres d'Allemagne (DIN), d'Autriche (ON) et de Suisse (SNV). Toutefois, seuls les termes et définitions donnés dans les langues officielles peuvent être considérés comme termes et définitions ISO.

Référence normative

La norme suivante contient des dispositions qui, par suite de la référence qui en est faite, constituent des dispositions valables pour la présente partie de l'ISO 11074. Au moment de la publication, l'édition indiquée était en vigueur. Toute norme est sujette à révision et les parties prenantes des accords fondés sur la présente partie de

l'ISO 11074 sont invitées à rechercher la possibilité d'appliquer l'édition la plus récente de la norme indiquée ci-après. Les membres de la CEI et de l'ISO possèdent le registre des Normes internationales en vigueur à un moment donné.

ISO 6107-6:1986, *Qualité de l'eau — Vocabulaire — Partie 6*.

Область применения

Настоящая часть ИСО 11074 определяет термины, используемые в определенных областях для характеристики качества почв. Она включает термины в области загрязнения и охраны почв, а также некоторые другие термины.

ПРИМЕЧАНИЕ — В дополнение к терминам и определениям на трех официальных языках ИСО (английском, французском и русском) настоящая часть ИСО 11074 включает также эквивалентные термины и их определения на немецком языке; они включены по просьбе Технического комитета ИСО/ТК 190 и публикуются под ответственность комитетов-членов Германии (ДИН), Австрии (ОН) и Швейцарии (СНВ). Однако только термины и определения на официальных языках могут рассматриваться как термины и определения ИСО.

Нормативная ссылка

Приведенный стандарт включает положения, на которые делается ссылка в тексте и которые становятся основополагающими для настоящей части ИСО 11074. На момент публикации указанное издание является действующим. Любой стандарт подвергается пересмотру, а сторонам, принимающим решения по пересмотру настоящей

части ИСО 11074, предлагается изыскать возможность применения последней редакций стандарта, приведенного ниже. Члены МЭК и ИСО имеют списки действующих на данное время международных стандартов.

ИСО 6107-6:1986, *Качество воды — Словарь — Часть 6*.

1 Terms relating to properties of soils and substances

1.1

partition coefficient

ratio between the concentrations of a substance in two environmental compartments

1.1.1

soil-water partition coefficient

K_d

ratio of the concentration of a substance in the soil solid phase to that in the soil-water phase

1.1.2

soil organic matter-water partition coefficient

ratio of the concentration of a substance in the soil organic matter fraction to that in the soil-water phase

NOTE This partition coefficient is often expressed in relation to the soil organic carbon content (hence: K_{oc}).

1.1.3

bioconcentration factor

BCF

ratio of the concentration of a substance in an organism to that in the soil

1.1.4

soil-plant partition coefficient

ratio between the concentration of a substance in soil and in plant material

1.2

filter characteristics

ability of a soil to retain or bind solid, dissolved or gaseous substances

1.3

sorption

reversible binding of a substance by soil constituents

NOTE Mechanisms of sorption include, for example, ion exchange, surface adsorption, dissolution of organic chemicals in the soil organic matter.

1 Termes relatifs aux propriétés des sols et des substances

1.1

coefficient de répartition

rapport des concentrations d'une substance dans deux compartiments environnementaux

1.1.1

coefficient de répartition sol-eau

K_d

rapport de la concentration d'une substance dans la phase solide du sol à celle dans la phase liquide du sol

1.1.2

coefficient de répartition matière organique du sol-eau

rapport de la concentration d'une substance contenue dans la matière organique du sol à celle dans l'eau

NOTE Ce coefficient de répartition est souvent exprimé par rapport à la teneur du sol en carbone organique (d'où: K_{oc}).

1.1.3

facteur de bioconcentration

FBC

rapport de la concentration d'une substance dans un organisme à celle dans le sol

1.1.4

coefficient de répartition sol-plante

rapport de la concentration d'une substance dans le sol à celle dans une plante

1.2

caractéristiques de rétention

capacité d'un sol à retenir ou à lier des substances solides, dissoutes ou gazeuses

1.3

sorption

liaison réversible d'une substance avec les constituants du sol

NOTE Les mécanismes de sorption comprennent, par exemple, les échanges d'ions, les adsorptions de surface, les dissolutions de composés chimiques organiques dans la matière organique du sol.

1 Термины в области свойств почвы и веществ

1.1

коэффициент распределения

отношение концентраций вещества в двух объектах окружающей среды

1.1.1

коэффициент распределения почва-вода

K_d

отношение концентрации вещества в твердой фазе почвы и в почвенной воде

1.1.2

коэффициент распределения органическое вещество почвы-вода

отношение концентрации вещества в органическом веществе и в почвенной воде

ПРИМЕЧАНИЕ — Коэффициент распределения часто выражается в отношении к органическому содержанию углерода в почве (поэтому: K_{oc}).

1.1.3

фактор биоконцентрации

(ФБК)

отношение концентрации вещества в почве и в почвенном организме

1.1.4

коэффициент почва-растение

отношение концентрации вещества в почве и в растениях

1.2

фильтрующая способность

способность почвы удерживать или связывать твердые, растворенные или газообразные вещества

1.3

сорбция

связывание вещества составными частями почвы в обменной форме

ПРИМЕЧАНИЕ — Процессами сорбции являются, например: ионообмен, адсорбция на поверхность, растворение органических веществ в органическом почвенном веществе.

1 Begriffe zu Eigenschaften von Böden und Stoffen

1.1

Verteilungskoeffizient

Quotient aus den Konzentrationen eines Stoffes in zwei Umweltkompartimenten

1.1.1

Verteilungskoeffizient Boden-Wasser

K_d

Quotient aus der Konzentration eines Stoffes in der festen Bodenphase und in der Bodenwasserphase

1.1.2

Verteilungskoeffizient organische Bodensubstanz-Wasser

Quotient aus der Konzentration eines Stoffes in der organischen Bodensubstanz und in der Bodenwasserphase

ANMERKUNG — Der Verteilungskoeffizient wird oft im Verhältnis zum organischen Kohlenstoffgehalt eines Bodens ausgedrückt (deshalb K_{oc}).

1.1.3

Biokoncentrationsfaktor

(BCF)

Quotient aus der Konzentration eines Stoffes in einem Organismus und im Boden

1.1.4

Verteilungskoeffizient Boden-Pflanze

Quotient aus der Konzentration eines Stoffes im Boden und im Pflanzenmaterial

1.2

Filtereigenschaften

Fähigkeit eines Bodens, feste, gelöste oder gasförmige Stoffe zurück- oder festzuhalten

1.3

Sorption

Umkehrbare Bindung eines Stoffes in austauschbarer Form durch Bodenbestandteile

ANMERKUNG — Sorptionsvorgänge sind z.B.: Ionenaustausch, Oberflächenadsorption, Auflösen organischer Chemikalien in organischer Bodensubstanz.

1.4**persistence**

resistance of a substance to chemical changes

NOTE 1 Persistence is always related to environmental conditions. Thus, a substance may be persistent in one soil, but not in another.

NOTE 2 Persistence may be expressed as the half-life of a substance under clearly defined environmental conditions.

1.5**decomposition**

breakdown of complex organic substances into simpler molecules or ions by physical, chemical and/or biological processes

1.5.1**biodegradation****biotic decomposition**

decomposition by organisms

1.5.2**abiotic decomposition****abiotic degradation**

decomposition by physical and/or chemical processes, e.g. photolysis, hydrolysis, oxidation and reduction

1.5.3**mineralization**

decomposition of organic matter or organic substances into carbon dioxide, water and the hydrides, oxides or other mineral salts

1.5.4**humification**

decomposition of organisms or parts thereof followed by synthesis of humic substances

1.5.5**primary degradation**

degradation or alteration of the molecular structure of a substance to an extent sufficient to remove some characteristic property

NOTE Adapted from ISO 6107-6:1986.

1.4**persistence**

résistance d'une substance aux modifications chimiques

NOTE 1 La persistance est toujours liée aux conditions environnementales. Ainsi, une substance peut être persistante dans un type de sol, mais non dans un autre.

NOTE 2 La persistance peut être exprimée comme la demi-vie d'une substance dans des conditions environnementales clairement définies.

1.5**décomposition**

dissociation des substances du complexe organique en molécules plus simples ou en ions par des processus physiques, chimiques et/ou biologiques

1.5.1**biodégradation****biodécomposition**

décomposition par des organismes

1.5.2**décomposition abiotique****dégradation abiotique**

décomposition par des processus physiques et/ou chimiques, par exemple photolyse, hydrolyse, oxydation et réduction

1.5.3**minéralisation**

décomposition de la matière organique ou de substances organiques en dioxyde de carbone, eau et en hydrures, oxydes ou autres sels minéraux

1.5.4**humification**

décomposition d'organismes ou de parties d'organismes suivie de la synthèse de substances humiques

1.5.5**dégradation primaire**

dégradation ou altération de la structure moléculaire d'une substance à un stade suffisamment avancé pour en éliminer une propriété caractéristique

NOTE Adaptée de l'ISO 6107-6:1986.