

Soil quality - Determination of effective cation exchange capacity and base saturation level using barium chloride solution (ISO 11260:1994+Cor 1:1996)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English Version

Soil quality - Determination of effective cation exchange capacity
and base saturation level using barium chloride solution (ISO
11260:1994+Cor 1:1996)

Qualité du sol - Détermination de la capacité d'échange
cationique effective et du taux de saturation en bases
échangeables à l'aide d'une solution de chlorure de baryum
(ISO 11260:1994+Cor 1:1996)

Bodenbeschaffenheit - Bestimmung der effektiven
Kationenaustauschkapazität und der Basensättigung unter
Verwendung von Bariumchloridlösung (ISO
11260:1994+Cor 1:1996)

This European Standard was approved by CEN on 3 June 2011.

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Management Centre: Avenue Marnix 17, B-1000 Brussels

Foreword

The text of ISO 11260:1994+Cor 1:1996 has been prepared by Technical Committee ISO/TC 190 “Soil quality” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 11260:2011 by 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of an identical text or by endorsement, at the latest by December 2011, and conflicting national standards shall be withdrawn at the latest by December 2011.

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.

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Endorsement notice

The text of ISO 11260:1994+Cor 1:1996 has been approved by CEN as a EN ISO 11260:2011 without any modification.

Soil quality — Determination of effective cation exchange capacity and base saturation level using barium chloride solution

1 Scope

This International Standard specifies a method for the determination of the cation exchange capacity (CEC) at the pH of the soil and of the determination of the content of exchangeable sodium, potassium, calcium and magnesium in soil.

This International Standard is applicable to all types of air-dried soil samples; pretreatment according to ISO 11464 is recommended.

NOTES

1 The method described suffers from interference from calcium as calcite or gypsum in the sample. Also, the presence of any soluble salts gives values for the exchangeable cations that are higher than the actual exchangeable amounts [3], [4].

2 Measurement of the specific electrical conductivity of the soil samples according to ISO 11265 will indicate if the soil samples are affected by salt.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3696:1987, *Water for analytical laboratory use — Specification and test methods*.

ISO 11265:—¹⁾, *Soil quality — Determination of the specific electrical conductivity*.

ISO 11464:—¹⁾, *Soil quality — Pretreatment of samples for physico-chemical analyses*.

3 Principle

The determination of CEC as specified in this International Standard is a modification of the method proposed by Gillman [5]. The CEC of soil samples is determined at the pH of the soil and at a low total ionic strength (about 0,01 mol/l).

The soil is first saturated with respect to barium by treating the soil three times with a 0,1 mol/l barium chloride solution. Thereafter, the soil is equilibrated with a 0,01 mol/l barium chloride solution. Subsequently, a known excess of 0,02 mol/l magnesium sulfate is added. All the barium present, in solution as well as adsorbed, is precipitated in the form of highly insoluble barium sulfate and, consequently, the sites with exchangeable ions are readily occupied by magnesium. The excess magnesium is determined by flame atomic absorption spectrometry (FAAS).

It is also possible to determine the concentrations of sodium, potassium, calcium and magnesium (and other elements such as iron, manganese and aluminium) in the 0,1 ml/l barium chloride extract of the soil.

If the barium chloride extract has a yellowish-brown colour, this indicates that some organic matter has

1) To be published.