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BSI Standards Publication

Carbonate and silicate liming materials — Determination of reactivity — Potentiometric titration method with hydrochloric acid

National foreword

This British Standard is the UK implementation of EN 13971:2020. It supersedes BS EN 13971:2012, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee CII/37, Fertilisers and related chemicals.

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

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English Version

Carbonate and silicate liming materials - Determination of reactivity - Potentiometric titration method with hydrochloric acid

Amendements minéraux basiques carbonatés et silicatés - Détermination de la réactivité - Méthode par titrage potentiométrique à l'acide chlorhydrique

Carbonatische und silikatische Kalkdünger - Bestimmung der Reaktivität - Potentiometrisches Titrationsverfahren mit Salzsäure

This European Standard was approved by CEN on 14 March 2020.

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

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European foreword

This document (EN 13971:2020) has been prepared by Technical Committee CEN/TC 260 “Fertilizers and liming materials”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by March 2021, and conflicting national standards shall be withdrawn at the latest by March 2021.

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

This document supersedes EN 13971:2012.

The following changes have been made to the former edition:

a) Clause 1, Scope enlarged by adding an indication of the special sample preparation for liming materials coarser than 1 mm;

b) Clause 11, Test report enlarged by adding a requirement on confirmation that partical size proportional weighing of the test sample was performed according to Annex A;

c) Clause 3, Terms and definitions editorially revised;

d) Clause 10, Precision editorially revised.

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Introduction

The results obtained by this method can be used to estimate the behaviour of the liming material in the soil. The results show a good correlation with the results obtained by a soil incubation method (see [1] to [6]). Regarding the precision of the method, the results are not used to declare a value, but to classify the different product groups.

1 Scope

This document specifies a method for the determination of the speed and effectiveness of the neutralizing potential of calcium carbonate, calcium magnesium carbonate and calcium magnesium silicate liming materials by potentiometric titration with hydrochloric acid.

For liming materials coarser than 1 mm, it is essential to prepare the sample of a liming material by following exactly the description of Annex A.

This method is applicable only to liming materials with a maximum particle size of 6,3 mm.

The type of liming material can be identified according to EN 14069 and the particle size can be determined according to EN 12948.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1482-2, *Fertilizers and liming materials — Sampling and sample preparation — Part 2: Sample preparation*

EN 12048, *Solid fertilizers and liming materials — Determination of moisture content — Gravimetric method by drying at (105 ± 2) °C (ISO 8190:1992 modified)*

EN 12944-3, *Fertilizers and liming materials — Vocabulary — Part 3: Terms relating to liming materials*

EN 12945, *Liming materials — Determination of neutralizing value — Titrimetric methods*

EN 12947, *Liming materials — Determination of magnesium content — Atomic absorption spectrometric method*

EN 12948, *Liming materials — Determination of size distribution by dry and wet sieving*

EN 13475, *Liming materials — Determination of calcium content — Oxalate method*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12944-3 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

4 Principle

Decomposition of carbonates and silicates with acids according to the following reactions:

$MeCO_3 + 2\ H^+ \rightarrow Me^{2+} + H_2O + CO_2$

$MeSiO_4 + 2\ H^+ \rightarrow Me(OH)_2 + SiO_2$

Titration under stable pH conditions either with an automatic titration apparatus or a manual method. The acid consumption during a given time is a direct measure of the reaction rate of the liming materials being tested.