
**Liming material — Determination
of neutralizing value — Titrimetric
methods**

*Amendements minéraux basiques — Détermination de la valeur
neutralisante — Méthodes par titrimétrie*



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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 134, *Fertilizers and soil conditioners*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This method has been developed to assess the ability of a product to deliver potential neutralization capacity, i.e. to neutralize protons or acidic cations in soils and consequently maintain or increase its pH. It relies on the measurement of hydrochloric acid consumption when a liming material is mixed in solution with hydrochloric acid in excess.

Two different procedures are described (method A and method B) because the titration to pH 7,0 is not applicable to silicate liming materials due to the precipitation of compounds at this pH value.

In method B, the turning point at pH 4,8 on the titration curve is taken as the end-point of the titration. For carbonaceous liming materials the difference in the consumption of sodium hydroxide solution for back titration between the titration end-points of pH 4,8 and pH 7,0 is negligible.

This document derives from the European standard EN 12945:2014+A1. However, its principle is the same as in AOAC 955.01 and BNQ 0419-070: 2011.

The following changes have been made to the EN 12945:2014+A1 edition:

- expression of results is allowed as CaCO_3 equivalent, not only as CaO or HO^- equivalents;
- [Annex B](#) has been completed accordingly to present all the necessary conversion tables;
- a new ISO international ring test was performed in 2017 to determine precision data (see [Clause 10](#))
- [Annex A](#) was revised accordingly.

Liming material — Determination of neutralizing value — Titrimetric methods

1 Scope

This document specifies two methods for the determination of the neutralizing value (NV) of liming materials.

Method A is applicable to all liming materials except silicate liming materials.

NOTE 1 Examples of hard liming materials are limestone and dolomite. Examples of soft liming materials are chalk, marl and burnt lime.

Method B is applicable to all liming materials.

Neither method correctly takes into account the potential neutralizing value of material containing more than 3 % P_2O_5 . For a more accurate agronomic assessment of products containing more than 3 % P_2O_5 , EN 14984 [8] is used to determine the liming efficiency.

NOTE 2 The methods described in ISO 6598 and ISO 7497 can be used for the determination of P_2O_5 content. Further information on P analyses is given in References [5] and [6].

NOTE 3 Carbonate consumes H^+ and removes acidity in solution with subsequent dissociation to H_2O and CO_2 . Forms of orthophosphate can consume H^+ but are not dissociated to molecular forms that remove acidity. The acidity is back titrated with alkali causing an underestimation of NV.

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.

ISO 3310-1, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth*

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

ISO 8157, *Fertilizers and soil conditioners — Vocabulary*

ISO 14820-2, *Fertilizers and liming materials — Sampling and sample preparation — Part 2: Sample preparation*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8157 apply.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4 Principle

Dissolution of the sample in a specified quantity of hydrochloric acid standard solution. Determination of the excess acid by back titration with a sodium hydroxide standard solution.