
**Soil quality — Determination of nitrate
nitrogen, ammonium nitrogen and total
soluble nitrogen in air-dry soils using
calcium chloride solution as extractant**

*Qualité du sol — Détermination de l'azote nitrique, de l'azote ammoniacal et
de l'azote soluble total dans les sols séchés à l'air en utilisant le chlorure de
calcium comme solution d'extraction*



Foreword

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Annexes A and B of this International Standard are for information only.

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Soil quality — Determination of nitrate nitrogen, ammonium nitrogen and total soluble nitrogen in air-dry soils using calcium chloride solution as extractant

1 Scope

This International Standard describes a method for the determination of soluble nitrogen fractions (nitrate, nitrite, ammonium and organic nitrogen) in a 0,01 mol/l calcium chloride extract of soil samples.

It is applicable to air-dry soil samples, pretreated in accordance with ISO 11464.

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 revisions, 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 11464:1994, *Soil quality — Pretreatment of samples for physico-chemical analyses*.

ISO 11465:1993, *Determination of dry matter and water content on a mass basis — Gravimetric method*.

3 Principle

By means of a simple extraction with a 0,01 mol/l calcium chloride (CaCl_2) solution of air-dry soil samples, different soluble nitrogen fractions are extracted (see references [1] and [2]). The concentrations of the inorganic nitrogen compounds nitrate (+ nitrite) and ammonia are measured directly in the extract using automated spectrometric methods.

For the determination of total soluble nitrogen, part of the extract is first digested whereafter the produced ammonia is converted to nitrate. This, together with the originally present nitrate (+ nitrite) and ammonia, is then measured using an automated spectrometric method. The content of soluble organic nitrogen is calculated by subtracting the content of nitrate (+ nitrite) and ammonium nitrogen from the content of soluble total nitrogen.

NOTES

- 1 The content of soluble organic nitrogen may give an indication of the easily mineralizable fraction of the organic matter.
- 2 The content of extractable ammonium and organic nitrogen of the soil is changed very often by drying, compared to the fresh soil sample. The way of drying affects the results (see reference [3]).
- 3 Since manual determinations for the different nitrogen fractions cause problems, in this International Standard measurements are specified using automated continuous flow techniques. Other ways of detection are permissible provided the results are in agreement with the results achieved by the specified automated procedures.