

INTERNATIONAL STANDARD

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Soil quality — Determination of phosphorus — Spectrometric determination of phosphorus soluble in sodium hydrogen carbonate solution

*Qualité du sol — Dosage du phosphore — Dosage spectrométrique du
phosphore soluble dans une solution d'hydrogénocarbonate de sodium*



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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 11263 was prepared by Technical Committee ISO/TC 190, *Soil quality*, Subcommittee SC 3, *Chemical methods and soil characteristics*.

Annex A of this International Standard is for information only.

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1 Scope

This International Standard specifies an extraction method and analytical conditions to determine the content of soil phosphorus soluble in sodium hydrogen carbonate solution. After the extraction step, two different methods of colour development are possible. Subclause 4.2 specifies colour development at room temperature. Subclause 4.3 specifies colour development after heating to a high temperature. This International Standard is applicable to all types of soils.

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

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

3 Principle

A soil, pretreated according to ISO 11464, is treated with a 0,5 mol/l sodium hydrogen carbonate solution at pH 8,50 to reduce the concentration of calcium, aluminium and iron(III) ions by precipitation of calcium carbonate and aluminium and iron(III) hydroxides and to release phosphate ions into solution.

The clear extract is analysed for phosphorus by a spectrometric method involving the formation of an antimony-phosphate-molybdate complex (at room temperature, 4.2) or a phosphate-molybdate complex (at a high temperature, 4.3) both reduced with ascorbic acid to form a deep-coloured, blue complex.

4 Reagents

All reagents shall be of recognized analytical grade. Use water complying with grade 2 of ISO 3696.

4.1 Reagents used in both colour developments

4.1.1 Sodium hydroxide solution, $c(\text{NaOH}) = 1 \text{ mol/l}$.

Dissolve $40,0 \text{ g} \pm 0,4 \text{ g}$ of sodium hydroxide (NaOH) pellets in water. Cool and dilute to 1 000 ml with water. Store in an inert and hermetically sealed bottle.

4.1.2 Extracting solution.

Dissolve $42,0 \text{ g} \pm 0,1 \text{ g}$ of sodium hydrogen carbonate (NaHCO_3) in 800 ml of water. Adjust the pH to $8,50 \pm 0,02$ with sodium hydroxide solution (4.1.1). Transfer the solution into a 1 000 ml volumetric flask and make up to the mark with water.

NOTE 1 This reagent shall be used within 4 h of preparation.