

INTERNATIONAL  
STANDARD

**ISO**  
**11048**

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**Soil quality — Determination of  
water-soluble and acid-soluble sulfate**

*Qualité du sol — Dosage du sulfate soluble dans l'eau et dans l'acide*



Reference number

## **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.

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 11048 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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# Soil quality — Determination of water-soluble and acid-soluble sulfate

## Section 1: General

### 1.1 Scope

This International Standard specifies procedures for the preparation of water and acid extracts of air-dried soils and soil-like materials. The sulfate content of these extracts is determined by a gravimetric method in which barium chloride is added to the water or acid extract and the precipitate of barium sulfate is dried and weighed. The sulfate content is then calculated from the mass of the material used in the analysis and the mass of barium sulfate precipitated.

This International Standard is applicable to all types of air-dried soils, for example pretreated according to ISO 11464.

This International Standard consists of seven sections:

Section 1: General

Section 2: Pretreatment of samples and determination of dry matter contents

Section 3: Extraction of soil with water at a mass:volume ratio of 1 soil:5 water

Section 4: Extraction of soil with water at a mass:volume ratio of 1 soil:2 water

Section 5: Extraction of soil with dilute hydrochloric acid

Section 6: Determination of sulfate in solution by a gravimetric method using barium chloride

Section 7: Precision of method and test report

### 1.2 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 9280:1990, *Water quality — Determination of sulfate — Gravimetric method using barium chloride*.

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*.

### 1.3 Principle

Samples of air-dried soil are extracted with:

— dilute hydrochloric acid; or

— water in a mass:volume ratio of soil:water of 1:2 or 1:5.

The sulfate content of these extracts is determined by a gravimetric method in which barium chloride is