INTERNATIONAL STANDARD

ISO 8190

First edition
1992-11-01

Solid fertilizers — Determination of moisture content — Gravimetric method by drying at (105 ± 2) °C

Engrais solides — Détermination de la teneur en eau — Méthode par séchage à (105 ± 2) °C

Reference number
ISO 8190:1992(E)

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 8190 was prepared by Technical Committee ISO/TC 134, *Fertilizers and soil conditioners*, Sub-Committee SC 4, *Chemical analysis*.

Annex A of this International Standard is for information only.

International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Solid fertilizers — Determination of moisture content — Gravimetric method by drying at (105 ± 2) °C

1 Scope

This International Standard specifies a gravimetric method, by drying at (105 ± 2) °C, for the determination of the moisture content of fertilizers.

The method is applicable to the following phosphatic fertilizers:

— superphosphates;

— natural phosphates;

— ground rock phosphates;

— partially solubilized rock phosphates.

The method is not applicable to ammonium compounds or magnesium sulfates.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was 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 edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 8358:1991, *Solid fertilizers — Preparation of samples for chemical and physical analysis.*

3 Principle

Drying a test portion at (105 ± 2) °C for 5 h and determination of the resulting loss in mass.

4 Material

4.1 Silica gel desiccant, self-indicating, particle size 2 mm to 5 mm.

Activate the silica gel, immediately prior to use, by placing about 100 g in the evaporating basin (5.3) and transferring the basin to the oven (5.4), set at 105 °C, for 2 h. Transfer the basin with its contents to a desiccator and allow to cool to ambient temperature.

5 Apparatus

Ordinary laboratory apparatus and, in particular, the following.

5.1 Weighing bottle, 70 mm to 80 mm diameter, fitted with a stopper.

5.2 Vacuum desiccator, internal diameter about 200 mm, containing silica gel desiccant (4.1).

5.3 Evaporating basin, internal diameter about 100 mm.

5.4 Oven, capable of being controlled at (105 ± 2) °C.

6 Preparation of test sample

Prepare the test sample, without grinding, in accordance with ISO 8358.

If necessary, quickly crush (not grind) the material in a mortar. Mix all the material and immediately take the test portion (7.1).

NOTE 1 It is advisable to crush the material in an atmosphere of relative humidity 40 % to 60 %.

7 Procedure

7.1 Test portion

Dry the weighing bottle (5.1) in the oven (5.4), set at 105 °C, for 2 h. Allow to cool to ambient temperature in a desiccator. Weigh, to the nearest 0,001 g, about 10 g of the test sample into the tared weighing bottle.

7.2 Determination

Place the unstoppered weighing bottle (5.1) containing the test portion, and the stopper, in the oven (5.4), set at 105 °C, for 5 h. Transfer the weighing bottle and the stopper to the desiccator (5.2) and allow to cool to ambient temperature. Open the desiccator, quickly restopper the weighing bottle and weigh the bottle and its contents to the nearest 0,001 g.

8 Expression of results

The moisture content of the fertilizer, expressed as a percentage by mass, is given by the formula

$$\frac{m_0 - m_1}{m_0} \times 100$$

where

m_0 is the mass, in grams, of the test portion before drying;

m_1 is the mass, in grams, of the test portion after drying.

Round the result, the mean of at least two determinations, to 0,1 % (*m/m*).

9 Test report

The test report shall include the following information:

a) a reference to this International Standard;

b) the results and the method of expression used;

c) all information necessary for the complete identification of the sample;

d) any unusual features noted during the determination;

e) any operation not included in this International Standard or in the International Standard to which reference is made, or regarded as optional.

Annex A
(informative)

Precision

A.1 General

The following precision data were determined from an experiment conducted in 1982 involving 21 laboratories using one sample of each of the following fertilizers: ammonium sulfate; natural phosphate; superphosphate 18 % (granular and also powdered). The method used employed the grinding and sieving of the sample whereas the published method involves crushing and therefore these data are included for information only.

A.2 Repeatability

The difference between two single test results obtained from identical test material by one analyst using the same apparatus within a short time-interval should exceed the repeatability limit, r, given by the following equation, on average not more than once in 20 cases in the normal and correct operation of the method.

$$r = 0{,}15\sqrt{m}$$

where m is the arithmetic mean of the two test results (i.e. two determinations).

A.3 Reproducibility

The difference between two single and independent test results found by two analysts working in different laboratories using identical test material should exceed the reproducibility limit, R, given by the following equation, on average not more than once in 20 cases in the normal and correct operation of the method.

$$R = 0{,}6\sqrt{M}$$

where M is the arithmetic mean of the two test results (i.e. two determinations).

UDC 631.8:543.21:543.812

Descriptors: fertilizers, tests, drying, determination, humidity, gravimetric analysis.

Price based on 3 pages