

INTERNATIONAL STANDARD

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157

Second edition
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Coal — Determination of forms of sulfur

Charbon — Détermination de la teneur en différentes formes de soufre



Reference number
ISO 157:1996(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 157 was prepared by Technical Committee ISO/TC 27, *Solid mineral fuels*, Subcommittee SC 5, *Methods of analysis*.

This second edition cancels and replaces the first edition (ISO 157:1975), of which it constitutes a technical revision.

Annex A of this International Standard is for information only.

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Introduction

For many purposes, a knowledge of the total sulfur content of a coal is sufficient, but for certain work it is also necessary to know how the sulfur is distributed between the coal substance and the mineral matter. In particular, such information may be required in connection with coal classification and cleaning.

Sulfur is usually present in coal in three forms, viz:

- a) sulfate sulfur, i.e. the sulfur present in the form of inorganic sulfates;
- b) pyritic sulfur, i.e. the sulfur present in the form of pyrites and marcasite;
- c) organic sulfur, i.e. the sulfur present in the form of organic sulfur compounds.

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Coal — Determination of forms of sulfur

Section 1: General

1.1 Scope

This International Standard specifies methods of determining the sulfate and pyritic sulfur contents of coals, including brown coals and lignites, and of calculating the amount of organic sulfur present.

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 331:1983, *Coal — Determination of moisture in the analysis sample — Direct gravimetric method.*

ISO 334:1993, *Solid mineral fuels — Determination of total sulfur — Eschka method.*

ISO 351:1995, *Solid mineral fuels — Determination of total sulfur — High temperature combustion method.*

ISO 1015:1992, *Brown coals and lignites — Determination of moisture content — Direct volumetric method.*

ISO 1170:1977, *Coal and coke — Calculation of analyses to different bases.*

ISO 1988:1975, *Hard coal — Sampling.*

ISO 5068:1983, *Brown coals and lignites — Determination of moisture content — Indirect gravimetric method.*

ISO 5069-2:1983, *Brown coals and lignites — Principles of sampling — Part 2: Sample preparation for determination of moisture content and for general analysis.*

1.3 Principle

The procedure described in this International Standard utilizes the differential solubilities of sulfates and pyrites in dilute hydrochloric and nitric acids under reflux conditions, such that each can be taken in solution successively and determined directly.

A general schematic representation of the procedure is given in figure 1.

1.4 Preparation of the test sample

The test sample is the general analysis test sample prepared in accordance with ISO 1988 or ISO 5069-2, as appropriate.

Grind about 25 g of the sample to pass a sieve of aperture 75 μm and ensure that its moisture content is in equilibrium with the laboratory atmosphere, exposing it if necessary in a thin layer for the minimum time required to achieve equilibrium.

Before commencing the determination, thoroughly mix the test sample for at least 1 min, preferably by mechanical means.

If the results are to be calculated other than on an air-dried basis (see 6.1) then, after weighing the test portion (see 2.4), determine the moisture content using a further portion of the test sample by the method described in ISO 331, ISO 1015 or ISO 5068, as appropriate.