International Standard

ISO 157

Coal — Determination of forms of sulfur

Charbon — Détermination de la teneur en différentes formes de soufre

Third edition
2025-05

Reference number
ISO 157:2025(en)

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Published in Switzerland

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 27, *Coal and coke,* Subcommittee SC 5, *Methods of analysis*.

This third edition cancels and replaces the second edition (ISO 157:1996), which has been technically revised. It also incorporates the Technical Corrigendum ISO 157:1996/Cor. 1:1999.

The main changes are as follows:

— Clause 2 has been updated;

— Clause 3 has been added and subsequent clauses have been renumbered;

— Formula (5), for organic sulfur, has been added;

— the test report has been updated.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

For many purposes, a knowledge of the total sulfur mass fraction of a coal is sufficient. However, 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 can be required in connection with coal classification and cleaning.

Sulfur is usually present in coal in three forms:

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

1 Scope

This document specifies methods of determining the sulfate and pyritic sulfur mass fraction of coals, and of calculating the amount of organic sulfur present.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 334, *Coal and coke — Determination of total sulfur — Eschka method*

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

ISO 5068-2, *Brown coals and lignites — Determination of moisture — Part 2: Indirect gravimetric method for moisture in the analysis sample*

ISO 11722, *Solid mineral fuels — Hard coal — Determination of moisture in the general analysis test sample by drying in nitrogen*

ISO 13909-4, *Coal and coke — Mechanical sampling — Part 4: Preparation of test samples of coal*

ISO 18283, *Coal and coke — Manual sampling*

ISO 19579, *Solid mineral fuels — Determination of sulfur by IR spectrometry*

ISO 20336, *Coal and coke — Determination of total sulfur by Coulomb titration method*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Principle

The procedure described in this document 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.

5 Preparation of test sample

The sample shall be the general analysis test sample prepared in accordance with the preparation procedures specified in ISO 13909-4 or ISO 18283.

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