
**Solid mineral fuels — Determination
of chlorine content**

Combustibles minéraux solides — Dosage de la teneur en chlore

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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.

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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 27, *Solid mineral fuels*, Subcommittee SC 5, *Methods of analysis*.

This first edition cancels and replaces ISO/TS 18806:2014, which has been technically revised.

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.

Solid mineral fuels — Determination of chlorine content

1 Scope

This document specifies two methods (high temperature combustion and high pressure vessel combustion) for the determination of chlorine in solid mineral fuels. It is applicable to solid mineral fuels.

The chlorine in the absorption solution can be determined using different finishes, such as coulometric or potentiometric titration, spectrophotometry or ion chromatography.

The method is applicable to determine the chlorine content higher than 0,005 % mass fraction.

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 687, *Solid mineral fuels — Coke — Determination of moisture in the general analysis test sample*

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

ISO 1213-2, *Solid mineral fuels — Vocabulary — Part 2: Terms relating to sampling, testing and analysis*

ISO 5068-2, *Brown coals and lignites — Determination of moisture content — 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*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1213-2 apply.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4 Principle

4.1 Method A — High temperature combustion

The sample is combusted in an oxygen atmosphere at high temperature. The gaseous combustion products collected in a trap filled with water include dissolved chloride compounds.

4.2 Method B — High pressure vessel combustion

The sample is combusted in an oxygen atmosphere in a high pressure vessel containing an absorption solution. The combustion products collected in an absorption solution include dissolved chloride compounds.

5 Reagents

5.1 Method A

5.1.1 **Oxygen**, pure, with an assay of at least 99,5 % volume fraction.

5.1.2 **Combustion aid (optional)**, e.g. spectroscopic carbon, iron phosphate (FePO_4), tungsten or quartz.

5.1.3 **Deionised water**, with a specific conductivity not higher than 0,2 mS/m at 25 °C.

5.2 Method B

5.2.1 **Oxygen**, pure, with an assay of at least 99,5 % volume fraction.

5.2.2 **Combustion aid (optional)**, paraffin, benzoic acid, polyethylene combustion bags, acetobutyrate capsules or other suitable materials.

5.2.3 **Fuse**, ignition wire (e.g. platinum) and cotton fuse (optional).

NOTE Check for a possible contribution of the cotton fuse to the chlorine content.

5.2.4 **Absorption solution**, either eluent used for ion chromatographic determination or alkaline solution (e.g. 0,2 mol/l KOH or 0,1 mol/l NaOH) or deionised water (5.1.3).

6 Apparatus

6.1 Method A

An example for the equipment for high-temperature combustion is given below. This equipment is suitable for manual determinations and is well established.

Automated systems with autosamplers can also be used if their main features comply with the manual apparatus specified below, i.e. mainly temperature of the oven, the use of fused silica glass tubes, and the absorption unit.

6.1.1 **Fused silica combustion tube, absorber and headpiece** (see [Figure 1](#)).

6.1.2 **Porcelain combustion boat**, with handle, e.g. 70 mm long, 10 mm wide, and 7 mm deep.

6.1.3 **Silica pusher**, with iron inlay (see [Figure 2](#)).

6.1.4 **Magnet**.

6.1.5 **Electrical tube furnace**, about 300 mm long, capable of being heated to preferably 1 300 °C and maintained at the combustion temperature of $(1\,250 \pm 25)$ °C.

6.1.6 **Flow meter**.

6.1.7 **Oxygen inlet**, consisting of a pierced silicon stopper with a glass tube.