INTERNATIONAL STANDARD

ISO 7404-2

Second edition
2009-10-01

Methods for the petrographic analysis of coals —

Part 2: Methods of preparing coal samples

Méthodes d'analyse pétrographique des charbons —

Partie 2: Préparation des échantillons de charbon

Reference number
ISO 7404-2:2009(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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.

ISO 7404-2 was prepared by Technical Committee ISO/TC 27, *Solid mineral fuels*.

This second edition cancels and replaces the first edition (ISO 7404-2:1985),which has been technically revised.

ISO 7404 consists of the following parts, under the general title *Methods for the petrographic analysis of coals*:

— *Part 1: Vocabulary*[1)]

— *Part 2: Methods of preparing coal samples*

— *Part 3: Method of determining maceral group composition*

— *Part 4: Methods of determining microlithotype, carbominerite and minerite composition*[1)]

— *Part 5: Method of determining microscopically the reflectance of vitrinite*

1) Parts 1 and 4 of this International Standard will be available under the original title, *Methods for the petrographic analysis of bituminous coal and anthracite*, until the revisions of these documents have reached the stage at which they are publicly available.

Introduction

Petrographic analyses have been recognized internationally as important in the context of the genesis, vertical and lateral variation, continuity, metamorphism and usage of coal. The International Committee for Coal Petrology (ICCP) has made recommendations concerning nomenclature and analytical methods and has published an extensive handbook that is continuously updated, describing in detail the characteristics of a wide range of coals. The text of this part of ISO 7404 agrees substantially with the text of the handbook and incorporates many useful comments made by members of the ICCP and by member bodies of ISO/TC 27, *Solid mineral fuels*.

Petrographic analyses of single-seam coals provide information about the rank, the maceral and microlithotype compositions and the distribution of mineral matter in the coal. The reflectance of vitrinite is a useful measure of coal rank and the distribution of the reflectance of vitrinite in a coal blend. Together with a maceral group analysis, it can provide information about chemical and technological properties of the coal and coal blend. Various other applications, like the characterization of bulk samples, cargoes, etc., and the precise determination of different rank vitrinites in complex coal blends are in use.

ISO 7404 (all parts) is concerned with the methods of petrographic analysis currently employed in characterizing coal in the context of its technological use and establishes a system for petrographic analysis.

The method is applicable for low-, medium- and high-rank coals.

The varied petrographic composition and hardness of coal and the type and amount of included mineral matter does not permit the formulation of a precise procedure that can be applied with equal success to all types and ranks of coal. For example, a successful preparation method for use with medium- and high-rank coals might not be applicable among low-rank coals. Within these limits, therefore, this part of ISO 7404 allows the operator to apply individual skills and experience to the preparation of a satisfactory polished surface. Nevertheless, recommended procedures that have been found applicable to a variety of coals, are given in the Annex A, which is for information only.

Many processes are involved between the mining of the coal and its preparation for industrial use. Petrographic analysis can be required at any stage on samples from the coal seam *in situ,* from borehole cores, on the raw product from the colliery, on the products from the preparation plant, or on the final product. The amount and size distribution of the coal being investigated thus varies widely and it is important to ensure that the sample obtained for petrographic analysis is fully representative.

Methods for the petrographic analysis of coals —

Part 2:
Methods of preparing coal samples

1 Scope

This part of ISO 7404 specifies methods for preparing a polished particulate block from a sample of crushed coal for analysis by reflectance microscopy. These methods can also be applied to the preparation of a polished, embedded lump of coal.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references the latest edition of the referenced document (including any amendment) applies.

ISO 3310-1, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth*

ISO 7404-1, *Methods for the petrographic analysis of bituminous coal and anthracite — Part 1: Vocabulary*[1)]

ISO 18283, *Hard coal and coke — Manual sampling*

ICCP International Handbook of Coal Petrography

3 Definitions

For the purpose of this document, the definitions given in ICCP International Handbook and in ISO 7404-1 apply.

4 Principle

A representative sample of air-dried coal is crushed to a specified particle size and mixed with a suitable binder. The mixture is formed into a particulate block, one face of which is ground and polished to give a relief-free and scratch-free surface for analysis by reflectance microscopy.

5 Reagents and materials

5.1 Binder, used to hold the particles of crushed coal together as a particulate block, or to embed a lump of coal.

The properties of the binder shall be such that

a) there shall be no chemical reaction with the coal or immersion oil;

b) for liquid binders such as polyester resin, the curing temperature required to make the particulate block should not exceed 100 °C and a temperature of less than 60 °C is preferable;