



ISO 7404-3

Coal — Methods for petrographic analysis —

Part 3:
Method of determining maceral group composition

Charbon — Méthodes d'analyse pétrographique —

Partie 3: Méthode de détermination de la composition en groupes de macéraux

**Fourth edition
2025-10**



COPYRIGHT PROTECTED DOCUMENT

© ISO 2025

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

This is a preview of ISO 7404-3:2025. [Click here to purchase the full version from the ANSI store.](#)

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	1
5 Reagents and materials	1
6 Apparatus	2
7 Preparation of coal sample	2
8 Procedure	2
9 Expression of results	3
9.1 Maceral groups.....	3
9.2 Individual macerals.....	4
10 Precision	5
10.1 Repeatability limit.....	5
10.2 Reproducibility limit.....	5
11 Test report	6
Annex A (informative) Sub-division of maceral groups	7
Bibliography	8

This is a preview of ISO 7404-3:2025. [Click here to purchase the full version from the ANSI store.](#)

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 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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, *Coal and coke*, Subcommittee SC 5, *Methods of analysis*.

This fourth edition cancels and replaces the third edition (ISO 7404-3:2009), which has been technically revised.

The main changes are as follows:

- input from the International Committee for Coal and Organic Petrology (ICCP) has been added;
- [Figure 1](#) labelling has been updated to include the point to be counted.

A list of all parts in the ISO 7404 series can be found on the ISO website.

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.

This is a preview of ISO 7404-3:2025. [Click here to purchase the full version from the ANSI store.](#)

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 and Organic Petrology (ICCP) has made recommendations concerning nomenclature, and analytical methods and has described in detail the characteristics of a wide range of coals.^{[1][2][3][4][5][6]} The ICCP also runs an accreditation program for maceral group analysis. This document incorporates many useful comments made by members of the ICCP and by member bodies of ISO/TC 27.

Petrographic analyses of a single coal provide information about the rank, the maceral and microlithotype compositions and the distribution of minerals in the coal. The reflectance of vitrinite (or huminite) is a useful measure of coal rank and the distribution of the reflectance of vitrinite (or huminite) in a coal blend, together with a maceral group analysis, can provide information about some important chemical and technological properties of the blend.

The ISO 7404 series is concerned with the methods of petrographic analysis currently employed in characterizing coal in the context of its technological or geological use, or both. It establishes a system for petrographic analysis.

ISO 11760 uses the maceral group composition as one of three parameters to classify coal; the other parameters are vitrinite reflectance and ash yield, respectively, for rank and grade.

Macerals are microscopically recognizable organic constituents of coal, and can be grouped together into three maceral groups: vitrinite (or huminite in lower rank coal), liptinite and inertinite.

Maceral groups and their subdivisions are listed in [Annex A](#) and described in detail in ISO 7404-1. The properties of a given coal are determined by the proportions and associations of the macerals and minerals present and by the rank of the coal. The method of determining maceral group composition described in this document applies to determinations made in reflected white light; the additional use of fluorescence microscopy is recommended when analysing lower rank coals.

In addition to the macerals, it is possible to identify certain minerals in coal; these can either be determined as separate categories or be ignored. As some of the minerals cannot be satisfactorily determined under the microscope, an estimate of the total mineral matter content can be obtained from the ash.

[Annex A](#) of this document is for information only.