
Coal — Determination of the thermal stability and thermal fragmentation





COPYRIGHT PROTECTED DOCUMENT

© ISO 2022

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

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	2
4.1 Thermal stability.....	2
4.2 Thermal fragmentation.....	2
5 Apparatus	2
6 Preparation of test sample	3
7 Procedure	3
7.1 Thermal stability.....	3
7.2 Thermal fragmentation.....	4
8 Expression of result	5
9 Precision	6
9.1 Repeatability limit.....	6
9.2 Reproducibility limit.....	6
10 Test report	6
Bibliography	7

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

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.

Introduction

Coal gasification is an important technology for clean coal conversion, which involves many factors. The thermal stability of coal is one of the essential parameters for the gasification industry and its relevant coal trade.

The thermal stability of coal is a measure of how much a coal retains its original size under high-temperature reaction during the process of gasification or high-temperature combustion. The coal with a better thermal stability can be gasified or burnt in its original size without being broken, or while being only a little bit broken, during the process of gasification or combustion, while the coal with a poor thermal stability will be broken into smaller piece or into powder. When using a coal with poor thermal stability for the gasification or combustion, the materials being taken from the furnace will increase, causing the resistance to increase, which in turn, affects the gasification or combustion and decreases the efficiency of the gasification. So, the thermal stability of coal is a very important property highly concerned by the gasification or combustion industry of utilizing the sized coal for gasification or combustion.

The opposite property of thermal stability of coal is the thermal fragmentation. Thermal fragmentation has a highly significant negative linear correlation with thermal stability.

This document is based on GB/T1573 and on an alternative laboratory method to determine thermal fragmentation of coal sources during pyrolysis in the gasification process given in Reference [3] including two parameters of thermal stability (TS_{+6}) and thermal fragmentation (TF), both of which can be used for guiding the coal gasification of fixed bed.