

ICS 75.160.10

CCS D 24



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 7702.20-2025

Replacing GB/T 7702.20-2008

**Test method for granular activated carbon from coal - Part 20:
Determination of pore volume and specific surface area**

煤质颗粒活性炭试验方法 第20部分：孔容积和比表面积的测定

Issued on: August 1, 2025

Implemented on: November 1, 2025

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

Preface	III
Introduction	V
1 Scope	1
2 Normative references	1
3 Terms and Definitions	1
4 Measurement Principle	3
5 Reagents and Materials	3
6 Instruments and Equipment	4
7 Sample preparation and degassing	5
8 Measurement Step	5
9 Result Processing	6
10 Measurement result precision	8
11 Quality Control	8
12 Test Report	8
Appendix A (Informative) Calculation of Micropore, Mesopore and Macropore Volumes	9

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is part 20 of GB/T 7702 Test methods for granular activated carbon from coal. GB/T 7702 has published the following parts.

- Part 1: Determination of moisture;
- Part 2: Determination of particle size;
- Part 3: Determination of strength;
- Part 4: Determination of packing density;
- Part 5: Determination of water capacity;
- Part 6: Determination of methylene blue adsorption value;
- Part 7: Determination of iodine adsorption value;

- Part 8: Determination of phenol adsorption value;
- Part 9: Determination of fire point;
- Part 10: Determination of the protection time of benzene vapor and ethyl chloride vapor;
- Part 13: Determination of carbon tetrachloride adsorption rate;
- Part 14: Determination of sulfur content;
- Part 15: Determination of ash content;
- Part 16: Determination of pH value;
- Part 17: Determination of floating rate;
- Part 18: Determination of caramel decolorization rate;
- Part 19: Determination of carbon tetrachloride desorption rate;
- Part 20: Determination of pore volume and specific surface area.

This document replaces GB/T 7702.20-2008 "Test method for granular activated carbon from coal - Determination of pore volume and specific surface area" and Compared with GB/T 7702.20-2008, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

- a) Some terms and definitions have been changed (see Chapter 3, Chapter 3 of the 2008 edition);
- b) The true density of the sample tested by the original solvent oil method has been deleted, and the true density of the sample tested by the gas expansion method has been added (see 8.1 of the 2008 edition);
- c) Added the requirements for sample degassing (see 7.2);
- d) Added specific surface area data processing requirements (see 9.2.3);
- e) Added quality control (see Chapter 11).

Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

This document was proposed by the China Coal Industry Association.

This document is under the jurisdiction of the National Coal Standardization Technical Committee (SAC/TC42).

This document was drafted by: Shanxi Xinhua Chemical Defense Equipment Research Institute Co., Ltd., China Ordnance Industry Standardization Institute, Coal Science and Technology RESEARCH INSTITUTE LIMITED.

The main drafters of this document are: Guo Jingjing, Zhou Xiaodong, Wei Weihua, Ding

Hua, Wu Linlin, Song Xiufeng, Wang Na, Wen Weili, Niu Ruihong, Wang Hui, Hu Lan, Wen Yuhui, Guo Junjun, Hu Yuliang, Liang Yaling, Song Zhenchao, Xu Ling, Huang Jimin, Xing Haoyang, Ji Xinpeng, Li Xianfu, Yang Jing, and Tian Xin.

The previous versions of this document and the documents it replaces are as follows.

- First issued as GB/T 7702.20-1987 in 1987, first revised in 1997;
- In the second revision in 2008, GB/T 7702.21-1997 "Test method for coal-based granular activated carbon - Determination of specific surface area" was incorporated.

The contents of GB/T 7702.21-1997 (the previous versions of GB/T 7702.21-1987)

- This is the third revision.

Introduction

GB/T 7702.7 mainly involves the determination of iodine adsorption value of coal-based granular activated carbon. GB/T 7702.7 aims to improve the accuracy of analysis.

To improve the accuracy and shorten the analysis cycle, GB/T 7702 is planned to consist of 20 parts.

- Part 1: Determination of moisture. The purpose is to evaluate the moisture content of activated carbon and provide a basis for subsequent customer use.
- Part 2: Determination of particle size. The purpose is to evaluate the particle size distribution of activated carbon.
- Part 3: Determination of strength. The purpose is to evaluate the wear resistance of activated carbon under certain conditions.
- Part 4: Determination of packing density. The purpose is to evaluate the bulk weight of activated carbon and provide users with the unit volume of activated carbon.

The quality of the product can provide users with a filling volume based on the design during use.

- Part 5: Determination of water capacity. The purpose is to evaluate the total pore volume of activated carbon and is a rapid test method during the production of activated carbon. A practical approach.
- Part 6: Determination of methylene blue adsorption value. The purpose is to evaluate the adsorption capacity of activated carbon submicropores, which is the decolorization of activated carbon liquid phase.

It is a major characterization method of adsorption capacity and is often used to evaluate activated carbon when used for liquid phase adsorption.

- Part 7: Determination of iodine adsorption value. The purpose is to evaluate the

microporous adsorption capacity of activated carbon, which is an indicator of the gas phase adsorption capacity of activated carbon.

A primary characterization method commonly used to evaluate activated carbon for gas phase adsorption.

- Part 8: Determination of phenol adsorption value. The purpose is to evaluate the adsorption capacity of activated carbon for alkanes.
- Part 9: Determination of fire point. The purpose is to evaluate the fire point of activated carbon and provide a design basis for users.
- Part 10: Determination of the protection time of benzene vapor and ethyl chloride vapor. The purpose is to evaluate the protection performance of activated carbon.
- Part 13: Determination of carbon tetrachloride adsorption rate. The purpose is to evaluate the saturated adsorption capacity of activated carbon for volatile organic compounds, mainly It is used for activated carbon gas phase adsorption, and is generally used more for VOC adsorption.
- Part 14: Determination of sulfur capacity. The purpose is to evaluate the static sulfur adsorption capacity of activated carbon, mainly used for raw gas desulfurization Representation of ability.
- Part 15: Determination of ash content. The purpose is to evaluate the oxidation degree of oxides of elements other than carbon in activated carbon.
- Part 16: Determination of pH. The purpose is to evaluate the acidity or alkalinity of the solution after activated carbon is immersed in water.
- Part 17: Determination of floating rate. The purpose is to evaluate the floating rate of activated carbon, which is the floating dust and bubbles on the surface of activated carbon in water.

The total content of the material.

- Part 18: Determination of caramel decolorization rate. The purpose is to evaluate the decolorization ability of macropores in activated carbon, mainly used for liquid organic Characterization of the ability of macromolecules to adsorb.
- Part 19: Determination of carbon tetrachloride desorption rate. The purpose is to evaluate the ability of activated carbon to remove organic matter.
- Part 20: Determination of pore volume and specific surface area. The purpose is to evaluate the pore distribution and adsorption capacity of activated carbon.
- Part 21: Determination of liquid phase dynamic adsorption capacity. The purpose is to evaluate the dynamic removal of soluble pollutants from water by activated carbon. ability.