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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 12910-2023

Replacing GB/T 12910-1991

Paper and board - Determination of titanium dioxide content

纸和纸板 二氧化钛含量的测定

(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents" Drafting:

This document replaces GB/T 12910-1991 "Determination of titanium dioxide content in paper and paperboard" and is consistent with GB/T 12910-1991 in addition to structural adjustments and editorial changes, the main technical changes are as follows:

a) Added terms and definitions (see Chapter 3);

b) The reagents have been changed (see Chapter 5, Chapter 4 of the:1991 edition);

c) The regulations on test water have been changed, and the normative reference document GB/T 6682 has been added (see 5.1, 4:1 of the:1991 edition);

d) Added the normative reference document GB/T 603 on the preparation method of hydrogen peroxide solution and potassium chloride solution (see 5.5 and 5:6);

e) Changed the optimal range of titanium dioxide content when preparing ash solution (see 8.1, 7:1 of the:1991 edition);

f) Changed the normative reference document on ash content determination, replacing GB/T 463 with GB/T 742 (see 8.2,:1991 version 7:2);

g) Added operating specifications for preparing titanium dioxide blank solution (see Chapter 9);

h) Changed the preparation method of calibration solution in the spectrophotometric test step (see 10.1, 8:1:1 of the:1991 version);

i) Added quantitative filter paper for filtering insoluble substances in ash solution (see 10.2);

j) Changed the preparation method of calibration solution in the flame atomic absorption spectrophotometry test step (see 11.1:1,:1991 version 9:1:1);

k) Changed the instrument calibration instructions and the wavelength used in flame atomic

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absorption spectrophotometry measurements (see 11.1:2,:1991 version 9:1:2);

l) Changed the handling method when the reading measured by the flame atomic absorption spectrophotometer exceeds the range of the standard solution (see 11.2:2, 9:2:1 of the:1991 version);

m) The principle of rounding the arithmetic mean of two measurement results in the test report has been changed (see Chapter 12, Chapter 10 of the:1991 edition):

This document is modified to adopt ISO 5647:2019 "Determination of titanium dioxide content in paper and paperboard":

Compared with ISO 5647:2019, this document has made the following structural adjustments:

a) 5:5 corresponds to 5:6 of ISO 5647:2019, 5:6 corresponds to 5:7 of ISO 5647:2019, and 5:7 corresponds to ISO 5647:2019 5:8,5:8 corresponds to 5:5 of ISO 5647:2019;

b) "Express the result as the arithmetic mean of the two measurement results, and the result is accurate to 0:1g/kg" in Chapter 12 corresponds to ISO 5647:

Contents of e) in Chapter 13 of:2019:

The technical differences between this document and ISO 5647:2019 and their reasons are as follows:

a) The textual expression of the scope has been changed (see Chapter 1, Chapter 1 of ISO 5647:2019) to comply with the requirements of my country's national standardization documents drafting rules;

b) Changed the requirements for distilled or deionized water (see 5.1, 5:1 of ISO 5647:2019), and added normative reference documents GB/T 6682 (see 5.1) to adapt to my country's technical conditions;

c) Added the normative reference document GB/T 603 on the preparation methods of hydrogen peroxide solution and potassium chloride solution (see 5.5 and 5:6), in order to comply with the writing rules of standardized documents;

d) Added porcelain crucibles in optional instruments and precautions for their use (see 6.1) to adapt to my country's technical conditions;

e) Changed the normative reference document on sampling, replacing ISO 186 with GB/T 450 (see Chapter 7, ISO 5647:2019 (Chapter 7) to adapt to my country's technical conditions;

f) Changed the normative reference document on moisture determination, replacing ISO 187 with GB/T 462 (see 8.1, ISO 5647:2019 8:1) to adapt to my country's technical conditions;

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g) Changed the normative reference document on ash content determination, replacing ISO 2144 with GB/T 742 (see 8.2, ISO 5647:

8:2) of:2019, to adapt to my country's technical conditions;

h) Added quantitative filter paper for filtration of insoluble substances in ash solution (see 10.2) to adapt to my country's technical conditions;

i) Added requirements for the relative deviation of parallel measurement results (see Chapter 12) to adapt to my country's technical conditions:

The following editorial changes have been made to this document:

a) Added a note on the description of the ICP/AES determination method (see Chapter 4);

b) Added a note on the preparation of titanium dioxide standard solution (see 5.8):

Please note that some content in this document may be subject to patents: The publisher of this document assumes no responsibility for identifying patents:

1 Scope

This document describes methods for the determination of titanium dioxide content in paper and board using spectrophotometry and flame atomic absorption spectrophotometry:

This document is applicable to the determination of titanium dioxide content in various papers and paperboards, especially coated or filled papers and paperboards:

Note: This method is used to determine titanium dioxide: Titanium present in other forms will not interfere with the determination results:

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text: Among them, the dated quotations for undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to this document:

GB/T 450 Collection of paper and cardboard samples and determination of longitudinal, transverse, front and back sides of the sample (GB/T 450-2008, ISO 186:

2002,MOD)

GB/T 462 Determination of moisture content of paper, cardboard and pulp analysis samples (GB/T 462-2023, ISO 287:2017, ISO 638-1:

2022,ISO 638-2:2022,MOD) GB/T 603 Preparation of preparations and products used in chemical reagent test methods (GB/T 603-2023, ISO 6353-1:

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1982,NEQ)

GB/T 742 Determination of burning residue (ash) of papermaking raw materials, pulp, paper and board (575°C and 900°C) (GB/T 742-2018,ISO 2144:2015,MOD) GB/T 6682 Analytical laboratory water specifications and test methods (GB/T 6682-2008, ISO 3696:1987, MOD)

3 Terms and definitions

The following terms and definitions apply to this document:

The amount of titanium dioxide (in terms of absolute dry mass) measured after ashing the sample and dissolving the ash using the method specified in this document:

4 Principles

After the sample is ashed, the resulting ash is dissolved with sulfuric acid and ammonium sulfate solutions, and then hydrogen peroxide is added to develop the color using spectrophotometry:

Determination, or measurement by flame atomic absorption spectrophotometry after adding potassium chloride solution:

Note: After the sample is ashed and the ash is dissolved, the titanium dioxide content in the solution can also be determined using the proven inductively coupled plasma/atomic emission spectrometry method:

(ICP/AES) and so on:

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