

ICS 85.040  
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**NATIONAL STANDARD OF THE  
PEOPLE'S REPUBLIC OF CHINA**

**GB/T 46757-2025**

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**Pulps - Kraft black liquor - Determination of residual alkali  
(potentiometric titration)**

纸浆 硫酸盐法黑液 残碱的测定 (电位滴定法)

**(English Translation)**

**Issued on: December 2, 2025**

**Implemented on: July 1, 2026**

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**Issued by: State Administration for Market Regulation**

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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 is modified to adopt ISO 23772:2023 "Determination of residual alkali by potentiometric titration of pulp cooking liquor from sulfate process".

Compared with ISO 23772:2023, this document has undergone the following structural adjustments.

- a) Move the portion of Chapter 5, Suspended Section, in ISO 23772:2023 to section 5.1, and renumber the subsequent clauses of Chapter 5 accordingly;
- b) Divide Chapter 8 of ISO 23772:2023 into sections 8.1 to 8.4;
- c) Divide the contents of Chapter 9 of ISO 23772:2023 into 9.1 to 9.8.

The technical differences between this document and ISO 23772:2023, and the reasons therefor, are as follows.

- a) The requirements for test water have been revised, and GB/T 6682, a normative reference, has been added to adapt to my country's technical conditions (see 5.1);
- b) Adjust the notes to 5.2 and 5.3 of ISO 23772:2023 to the clause content (see 5.3 and 5.4);
- c) The pH and preparation method of the standard buffer solution were modified to suit the technical conditions of laboratories in my country (see 5.6);
- d) The calibration and inspection requirements for pH meters have been changed to suit my country's technical conditions (see Chapter 8).

The following editorial changes have been made to this document.

- a) The standard title has been changed to "Determination of Residual Alkali in Black Liquor from the Sulfate Process in Pulp (Polypotentiometric Titration)";
- b) The URLs for the ISO and IEC terminology databases have been removed;
- c) Notes 1 and 4 in Chapter 10 of ISO 23772:2023 have been deleted.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China National Light Industry Council.

This document is under the jurisdiction of the National Technical Committee on Standardization of Paper Industry (SAC/TC141).

## 1 Scope

This document describes a method for determining the residual alkali concentration in sulfate-process black liquor using potentiometric titration.

This document applies to the determination of residual alkali concentration in sulfate black liquor with an initial pH of not less than 11.0 and a solid content of not more than 40%.

The detection limit for the method specified in this document is 0.1 g/L (calculated as NaOH).

## 2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

GB/T 6682 Specifications and test methods for water used in analytical laboratories (GB/T 6682-2008, ISO 3696:1987, MOD)

## 3 Terms and Definitions

The following terms and definitions apply to this document.

residual alkali

The concentration of hydroxide ions remaining in black liquor.

**Note 1:** When sodium sulfide (or potassium sulfide) dissolves in water, the sulfide ions hydrolyze to produce hydroxide ions.

**Note 2:** The units are expressed as the number of moles of hydroxide ions per liter of sample (mol/L) or the number of grams of sodium hydroxide per liter of sample (g/L).

## 4 Principles

The alkaline substances in the black liquor sample were potentiometrically titrated with hydrochloric acid until the first inflection point appeared (pH between 11.0 and 11.5).

Sodium carbonate is added to the sample before titration to buffer the titration solution and obtain a better inflection point. If the initial pH of the black liquor sample is within a certain range...

If the pH is between 11.0 and 12.5, add a known volume of sodium hydroxide to the sample before titration. Calculate the hydrochloric acid consumption based on the amount consumed at the first inflection point.

The residual alkali concentration was corrected using a correction factor to eliminate the influence of other alkaline substances, ultimately yielding the hydroxide ion concentration. (Precise) See Appendix A for the degree data.

## 5 Reagents

Unless otherwise specified, use only analytical grade reagents.

### 5.1

Water, GB/T 6682, Grade III.