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

GB/T 9872-2026

Replacing GB/T 9872-1998, GB/T 34692-2017

**Rubber and thermoplastic elastomer - Determination of halogen
content**

橡胶和热塑性弹性体 卤素含量的测定

(English Translation)

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Table of Contents

Foreword
Introduction
1 Scope
2 Normative references
3 Terms and Definitions
4 Principles
5 Sample Preparation
5.1 Sampling

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 supersedes GB/T 9872-1998 "Determination of Bromine and Chlorine Content in Rubber and Rubber Products by Oxygen Cylinder Combustion Method" and GB/T 34692-2017 "Determination of Halogen Content in Thermoplastic Elastomers - Oxygen Bomb Combustion-Ion Chromatography". This document is based on GB/T 9872-1998, and is a complete version.

It conforms to the content of GB/T 34692-2017. Compared with GB/T 9872-1998, apart from structural adjustments and editorial changes, the main technical aspects are the same.

The changes are as follows.

- The scope has been changed (see Chapter 1, Chapter 1 of the 1998 edition);
- Ion chromatography has been added (see Chapter 6);
- Visual titration has been removed (see 6.3.2 and 7.2 in the 1998 edition);
- A tube furnace combustion method for preparing sample solutions has been added (see Appendix A).

This document is modified to adopt ISO 7725:2020 "Rubber and rubber products - Determination of chlorine and bromine content".

The technical differences between this document and ISO 7725:2020, and the reasons therefor, are as follows.

---The scope has been changed (see Chapter 1) to broaden its applicability by adding "thermoplastic elastomers";

---ISO 1795 has been replaced by the normatively referenced GB/T 15340, and ISO 4661-2 has been replaced by GB/T 17783 (see 5.1).

Adapt to my country's technological conditions;

---ISO 3696 (see 6.1.1, 7.1.1, A.2.1, B.2.1, C.2.1) has been replaced with the normatively referenced GB/T 6682 to suit my needs.

National technical conditions;

---Requirements for the calibration curve gradient and correlation coefficient have been added (see 6.3.2) for ease of use;

---The combustion improver "methanol" (see C.2.8) has been added for ease of use.

The following editorial changes have also been made to this document.

---To harmonize with existing standards, the standard title has been changed to "Determination of Halogen Content in Rubber and Thermoplastic Elastomers";

---The relevant information about ion chromatography instruments has been removed;

---Change the chromatographic column and test conditions to those commonly used in China (see Appendix D).

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 Petroleum and Chemical Industry Federation.

This document is under the jurisdiction of the National Technical Committee on Standardization of Rubber and Rubber Products (SAC/TC35).

Introduction

The two quantitative analytical methods in this document are applicable to any type of substance containing chlorine and/or bromine (in any form, such as polymer chains).

Rubber (i.e., raw rubber, vulcanized rubber, or unvulcanized rubber) and thermoplastic elastomers and their products, which contain elements, chemical additives, or contaminants.

This document describes three methods for preparing sample solutions. tube furnace combustion, oxygen flask combustion, and oxygen bomb combustion. Sample solution preparation...

After preparation, the content is determined by ion chromatography or potentiometric

titration. From the perspectives of testing time and safety, this is the most convenient and efficient method.

The method combines tubular furnace combustion and ion chromatography, as ion chromatography is widely used for the quality control of polymer/rubber products.

In the field of environmental analysis.

Determination of halogen content in rubber and thermoplastic elastomers Warning 1---Personnel using this document must be familiar with standard laboratory operating procedures. This document does not address all possible safety issues.

Users are responsible for taking appropriate safety and health measures and ensuring compliance with relevant national regulations.

Warning 2---Some procedures outlined in this document may involve the use of substances or the generation of waste. This may lead to local [issues/problems].

Due to environmental hazards, safe handling and disposal should be carried out in accordance with relevant documents after use.

1 Scope

This document describes ion chromatography (Method A) and potentiometric titration (Method B) methods for determining the chlorine and bromine content in rubber and thermoplastic elastomers.

This document applies to the determination of chlorine and bromine content in rubber and its products, and thermoplastic elastomers and their products, as well as the determination of other halogen elements.

For reference only.

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) GB/T 15340 Sampling and sample preparation methods for natural and synthetic raw rubber (GB/T 15340-2025, ISO 1795:2017, IDT) GB/T 17783 Preparation of chemical test samples and specimens for vulcanized or thermoplastic rubber (GB/T 17783-2019) ISO 4661-2:2018, MOD)

3 Terms and Definitions

This document does not contain any terms or definitions that need to be defined.

4 Principles

The rubber sample is burned in a tube furnace under oxygen-filled conditions, and the combustion gas is introduced into the absorbent to obtain a sample solution; or the rubber sample is placed in...

The sample solution is obtained by direct combustion in an oxygen combustion flask or oxygen bomb combustion flask containing an absorbent liquid. The combustion gas is absorbed by the absorbent liquid. [The text then abruptly shifts to a different topic.] Using a centrifuge...

The sample solution is analyzed by subchromatography or potentiometric titration, and the content of chlorine and bromine in the sample is calculated.

For rubber samples with chlorine and bromine content below 0.1%, the inflection point of method B may not be obtainable, and method A is preferred.

5.1 Sampling

For raw rubber, sampling shall be carried out in accordance with the method of GB/T 15340.

For thermoplastic elastomers, vulcanized rubber and unvulcanized rubber, sampling shall be carried out in accordance with the method of GB/T 17783.

Note: The chlorine and bromine content determined by the above sampling method includes contributions from additives and contaminants in the rubber, unless removed in advance by extraction.