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

GB/T 33078-2016

**Rubber -- Identification of anti-degradants -- Gas
chromatography/mass spectrometry**

橡胶 防老剂的测定 气相色谱-质谱法

(English Translation)

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Foreword

This standard is drafted in accordance with the rules given in GB/T 1.1-2009.

This standard uses the translation method equivalent to ISO 10638.:2010 "Determination of antioxidants in rubber by gas chromatography - mass spectrometry" (English version).

And the normative reference in this standard international documents are consistent with the relationship between China's documents are as follows.

Determination of rubber solvent extract (ISO 1407..1992MOD) GB/T 3516-2006;

Concentrated natural latex sampling (ISO 123..2001MOD); GB/T 8290-2008.

Determination of total solid content of concentrated natural latex GB/T 8298-2008 (ISO 124..1997MOD);

Natural and synthetic raw rubber samples and methods for making samples (ISO 1795.:2000 IDT) GB/T 15340-2008.

Preparation of vulcanized rubber samples and samples - Chemical tests (ISO 4661-2. 1987 IDT) GB/T 17783-1999.

This standard is proposed by the China Petroleum and Chemical Industry Association.

This standard by the National Rubber and Rubber Products Standardization Technical Committee (SAC/TC35) centralized.

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inspection center, Beijing Rubber Industry Research and Design Institute, round Jinyu Group Co., Ltd., Beijing Physical and Chemical Analysis and Testing Center.

Introduction

Most rubber products in order to extend the service life with antioxidants, anti-aging agent type according to a specific product use environment may be.

Rubber antioxidants are increasingly being suspected of containing substances that may have a negative impact on the environment. But, made of rubber it is not easy to have the type of antioxidant present in the product.

In the national standard GB/T 4499 provides the use of thin-layer chromatography qualitative analysis of antioxidants method. The method requires the operator to manipulate the process is highly skilled and should have a lot of knowledge and experience, but also need to use the standard reference material.

The gas chromatography-mass spectrometry specified in this standard is the determination of rubber products and the raw rubber and unvulcanized rubber used in the production of these products.

An effective method of antioxidant.

Rubber - Determination of antioxidants - Gas chromatography - mass spectrometry
WARNING. People using this standard should be familiar with formal laboratory practices. This standard does not address all of the security issues associated with it.

It is the responsibility of the user to take appropriate safety and health measures and to ensure compliance with the relevant provisions of national laws and regulations.

Note: Some of the steps specified in this standard may produce some substances or wastes that may cause a risk to the local environment.

harm. After use should refer to the appropriate documents for the safe handling and disposal of these substances.

1 Scope

This standard specifies the use of gas chromatography-mass spectrometry for the determination of raw rubber, latex, unvulcanized or vulcanized rubber products in the antioxidant method.

The method prescribed in this standard is a qualitative method and can not be used as a quantitative analysis.

This standard applies to the determination of 31 types of antioxidants see Appendix A.

Note: This standard does not cover detailed procedures for equipment operation. The operator of

this standard is familiar with the procedure of the gas chromatography-mass spectrometer. In addition, according to Use the Gas Chromatography-Mass Spectrometer User's Manual to ensure that the instrument is in the best condition.

2 Normative reference documents

The following documents are indispensable for the application of this document. For dated references, only the dated edition applies to this article Pieces. For undated references, the latest edition (including all modifications) applies to this document.

ISO 12 rubber latex sampling (Rubberlatex-Sampling) ISO 124 Rubber latex total solid content determination (Latex, rubber-Determinationoftotalsolidscontent) ISO 1407 Determination of rubber solvent extract (Rubber-Determination ofsolventextract) ISO 1795 natural raw rubber and synthetic raw rubber samples and sample preparation method (Rubber, rawnaturalandrawsynthetic-Samplingandfurtherpreparativeprocedures) ISO 4661-2 vulcanized rubber samples and preparation of samples - Part 2. Chemical tests (Rubber, vulcanized-Preparation ofsamplesandtestpieces-Part 2. Chemicaltests)

3 Principle

The antioxidant in the rubber is treated by pyrolysis or solvent extraction and then measured by a gas chromatography-mass spectrometer. The antioxidant type Identified by mass spectrometry. If necessary, the retention index can be used as an auxiliary identification method.

4.1 Reagents and materials

4.1.1

Refrigerants. eg liquid nitrogen, used only in special thermal analytical instruments.

4.1.2

Gas chromatograph Carrier gas. helium.

4.2 Instruments

4.2.1

Thermo-analytical instruments or devices. Connect to gas chromatography and heat to 340 ° C.

Note: The cracker is an equivalent thermo-analytical instrument that can be maintained at a lower heating temperature.