INTERNATIONAL STANDARD

ISO 19242

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Rubber — Determination of total sulfur content by ion chromatography

Caoutchouc — Détermination de la teneur en soufre total par chromatographie ionique

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 2, *Testing and analysis*.

Introduction

Titration methods using thorin, a toxic arsenic compound as a reagent, have been used to determine the total sulfur content in raw rubber and rubber compounds. In this International Standard the sulfur in a test piece is burnt and oxidized to sulfur dioxide, which is then absorbed into a hydrogen peroxide solution and converted to sulfuric acid for determination by ion chromatography.

No hazardous reagents are required, thus improving the working environment as well as being eco-friendly. In addition, ion chromatography is used worldwide for its simplicity and high accuracy.

Rubber — Determination of total sulfur content by ion chromatography

WARNING 1 — Persons using this International Standard should be familiar with normal laboratory practice. This International Standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

WARNING 2 — The use of this International Standard pre-supposes sufficient working knowledge of the principles and techniques of ion chromatography for the analyst to perform the operations described and interpret the results correctly.

CAUTION — Certain procedures specified in this International Standard may involve the use or generation of substances, or the generation of waste, that could constitute a local environmental hazard. Reference should be made to appropriate documentation on safe handling and disposal after use.

1 Scope

This International Standard specifies a method for the determination of the total sulfur content of raw rubber and unvulcanized or vulcanized rubber compounds by ion chromatography following the preparation of a sample solution using either a tubular furnace combustion or an oxygen combustion flask method.

The tubular furnace combustion method is applicable for rubbers with sulfur content less than 0,1 % as it is possible that the oxygen combustion flask method will not give sufficiently accurate results.

The oxygen combustion flask method is not applicable to rubbers containing a metal salt that forms an insoluble metal sulfate, such as barium sulfate.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 1795, *Rubber, raw natural and raw synthetic — Sampling and further preparative procedures*

ISO 4661-2, *Rubber, vulcanized — Preparation of samples and test pieces — Part 2: Chemical tests*

3 Principle

3.1 Combustion

3.1.1 Tubular furnace combustion method

A test piece is burnt in an oxygen stream in a tubular furnace with an electrical heater. The sulfur in the test piece is oxidized to sulfur dioxide, which is absorbed into hydrogen peroxide solution and converted to sulfuric acid.