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

GB/T 14837.1-2014

Replacing GB/T 14837-1993

Rubber and rubber products -- Determination of the composition of vulcanizates and uncured compounds by thermogravimetry -- Part 1: Butadiene, ethylene-propylene copolymer and terpolymer, isobutene-isoprene, isoprene and styrene-butadiene rubbers

橡胶和橡胶制品 热重分析法测定硫化胶和未硫化胶的成分 第1部分：丁二烯橡胶、乙烯-丙烯二元和三元共聚物、异丁烯-异戊二烯橡胶、异戊二烯橡胶、苯乙烯-丁二烯橡胶

(English Translation)

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Foreword

GB/T 14837 "rubber and rubber products by thermogravimetric analysis of vulcanized rubber and non-vulcanized rubber composition" is divided into three parts.

- Part 1. Butadiene rubber, ethylene-propylene binary and terpolymers, isobutylene-isoprene rubber, isoprene rubber, Styrene - butadiene rubber;
- Part 2. acrylonitrile - butadiene rubber and halogenated butyl rubber;
- Part 3. Extraction of hydrocarbon rubber, halogenated rubber, silicone rubber.

This part is part 1 of GB/T 14837.

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

This part of the replacement GB/T 14837-1993 "rubber and rubber products, the determination of the composition of thermogravimetric analysis." With GB/T 14837-1993, the main technical differences are as follows.

--- modified the standard name;

--- Added normative reference document GB/T 14838-2009 (see Chapter 2);

- "Calcium carbonate" and "Standard reference carbon black" in "Reagents and Materials" were deleted (see 1993 edition 4.3, 4.4);

--- modified the thermocouple analyzer component configuration requirements (see 5.1, 1993 version 5.1);

- the requirement for nitrogen flow rates "25 mL/min to 40 mL/min" was deleted (see 1993 version 6.1.1, 6.2.5);

- an increase in the identification of carbon black and calcium carbonate (see 6.2.1);

- the provisions for the "cooling rate" of 20 ° C/min "were deleted (see 1993 version 6.2.8, 6.2.10, 7.8);

- increased precision (see Chapter 9);

- modified the contents of the test report (see Chapter 10, Chapter 9 of 1993).

This part uses the re-drafting method to modify ISO 9924-1.:2000 "Rubber and rubber products Thermogravimetric determination of vulcanized and unvulcanized Ingredients of gums Part 1. Butadiene rubber Ethylene-propylene Binary and terpolymer Isobutylene-isoprene rubber Isoprene Rubber styrene-butadiene rubber ".

The technical differences between this section and ISO 9924-1.:2000 are as follows.

- Added "if graphite exists" (see 3.3, 7.2.7, 8.1.3, 8.1.4, 8.2.4). Graphite is rubber during mixing and vulcanization may be used as a reinforcing agent, after the increase in the content of this part more comprehensive.

- modified part of the principle, the "nitrogen atmosphere in the furnace temperature from 550 °C to 650 °C," "insulation 15min or Baseline Straight "(ISO 9924-1.:2000, 3.3) was changed to" lowering the furnace temperature to 300 ° C under a nitrogen atmosphere "and" to a temperature of 650 ° C for 15 min or until constant weight "(3.3 in this section). The modified principle is more reasonable and is" Sudden "section consistent.

- The temperature rise rate in the operation step was modified, and the "maximum heating rate reached by the instrument" was changed to "heating rate 20 ° C/min or as soon as possible the rate of heating up "(7.2.7 in this section, 7.2.7 of ISO 9924-1.:2000). After modification, the sample decomposition process More uniform and conducive to uniform operation steps.

- modified 8.2.3, the carbon black content of "from 550 °C to 650 °C stage quality change percentage" (ISO 9924-1.:2000 8.2.4) to "Percentage of mass change from 300 ° C to 650 ° C at constant temperature" (8.2.3 of this standard). After modification the statement is more reasonable and consistent with the "measurement steps" section.

This part is compared with ISO 9924-1.:2000 in the normative technical documents to adapt to China's technical conditions, the adjustment of the situation Reflected in Chapter 2, "Normative references", as follows.

Replace GB/T 3516-2006 with international standard ISO 1407.:1992;

Replace ISO/T R9272..1996 with GB/T 14838-2009 in accordance with ISO/T R9272..2005.

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

This part of the National Rubber and Rubber Products Standardization Technical Committee General Test Methodology Branch (SAC/TC35/SC2) centralized.

This part of the drafting unit. China Petrochemical Co., Ltd. Beijing North Chemical Institute Yanshan Branch, Guizhou Tire Co., Ltd., CNPC Shares of Dushanzi Petrochemical Branch Research Institute, Beijing Rubber Industry Research and Design Institute, Guangzhou Synthetic Materials Research Institute Co., Ltd., Shanghai Quality Supervision and

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This part of the previous version of the standard to replace the release of the situation.

--- GB/T 14837-1993.

Rubber and rubber products - Determination of vulcanizates by thermogravimetric analysis and unvulcanized gums Part 1. Butadiene Rubber, ethylene-propylene binary and terpolymer, Isobutylene-isoprene rubber, isoprene rubber, Styrene-butadiene rubber
WARNING. Personnel using this section should have practical experience in formal laboratory work. This section does not indicate all possible security issues.

It is the responsibility of the user to take appropriate safety and health measures and to ensure compliance with the conditions set forth in the relevant national regulations.

1 Scope

1.1

This part of GB/T 14837 specifies the use of thermogravimetric analyzers for the determination of total organic matter, carbon black and ash in vulcanized and unvulcanized plastics.

Component content method. Where the mass loss at 300 ° C is an approximation of the volatile matter content in the compound.

1.2

This part applies to the following rubber and its use or combination of vulcanized rubber or rubber.

- a) synthetic isoprene rubber or natural rubber (IR or NR);
- b) Butadiene rubber (BR);
- c) styrene-butadiene rubber (SBR);
- d) isobutylene-isoprene rubber (commonly known as butyl rubber, IIR);
- e) ethylene-propylene binary and terpolymer (EPM, EPDM).

NOTE: If the method is pre-validated for the known compounds and vulcanizates containing similar components, the scope of application of this method may be extended to Analysis of other compounds outside. Analysis of other compound components is within the scope of Part 2 of GB/T 14837.

1.3

This part does not apply to rubber, such as chlorine or nitrogen-containing rubber, which forms a carbonaceous residue at the time of cracking.

1.4

This part does not apply to the various vulcanizates or compounds that contain carbonaceous residues at the time of cracking, such as those containing cobalt Salt, lead salt and phenolic resin vulcanized rubber or rubber.

1.5

This part does not apply to polymers containing mineral fillers such as carbonate or hydrated alumina, which are grown at 25 ° C to 650 ° C Decomposition occurs within the test temperature range. If it is necessary to use, should be based on the characteristics of the appropriate packing correction.

1.6

This part does not apply to the following vulcanizates and unvulcanized rubber in the determination of the total polymer content. according to GB/T 3516-2006 can not be completely Removal of vulcanized rubber and unvulcanized rubber of non-rubber organic components.

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.

GB/T 3516-2006 Determination of rubber solvent extract (ISO 1407.:1992, MOD) Testing methods for rubber and rubber products - Determination of standard precision (ISO/TR. 9272..2005, IDT)

3 Principle

3.1

The heated sample was heated from 70 ° C to 300 ° C under a nitrogen atmosphere at a temperature programmed at 300 ° C for 10 min.