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

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**Determination of the microstructure of solution-polymerized
SBR**

溶液聚合苯乙烯-丁二烯橡胶（SSBR）微观结构的测定

(English Translation)

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Foreword

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

This standard uses the translation method identical with ISO 21561:2005 "styrene - butadiene rubber (SBR) solution polymerization styrene - butadiene Determination rubber (SBR) microscopic structure "(in English) and amendments thereto ISO 21561:2005/Amd.1.2010 (in English).

Correspondence between the consistency of the standards of international documents and normative references of the following documents.

Determination of matter (ISO 1407:1992, MOD) --- GB/T 3516-2006 rubber solvent extraction;

--- GB/T 15340-2008 natural and synthetic rubber raw sampling and sample preparation method (ISO 1795:2000, IDT).

For ease of use, this standard made the following editorial changes.

--- Modify the standard name;

--- Deleted international standards foreword;

--- Inclusion content of international standards amendment.

The standard proposed by China Petroleum and Chemical Industry Association.

This standard by the national Common test methods for rubber and rubber goods Technical Committee of Standardization Technical Committee (SAC/TC35/SC2) Centralized.

This standard was drafted. China PetroChina Lanzhou Chemical Research Center, China Petroleum & Chemical Corporation North Beijing North Branch of the Academy of Yanshan, China PetroChina Dushanzi Petrochemical Research Institute, Ltd. tournament round,

Beijing rubber workers Industry Research and Design Institute, Qingdao Yi Kesi New Materials Co., Ltd.

1 Scope

This standard specifies the use of ^1H - NMR spectroscopy (juc cogens) and infrared spectroscopy (relative method) for solution polymerization SBR (SSBR) Zhong Ding Microstructure and styrene monomer content of the diene monomer was measured by quantitative analysis method. The styrene content is expressed relative to the entire the mass fraction of the polymer. 1,4-trans structure, 1,4-cis structure and a 1,2-vinyl structure content is expressed relative to the butadiene part the mole fraction.

NOTE: using known microstructure content SSBRs (obtained by ^1H - NMR spectroscopy) calibrated, IR must also be given microstructure Values.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document.

ISO 1407 Rubber - Determination of solvent extract (Rubber-Determinationofsolventextract)
ISO 1795 natural and synthetic rubber raw sampling and sample preparation method (Rubber, rawnaturalandrawsynthetic-Sampling andfurtherpreparativeprocedures)

3.1 Principle

3.1.1

A small amount of extract had SSBR sample was dissolved in deuterated chloroform.

3.1.2

sample solution ^1H - NMR spectra were measured at 15ppm width. Butadiene 1,4-bond (1,4-trans bond and the sum of 1,4-cis bonds) and 1,2-vinyl peak area peak area was determined together with styrene. Microstructure of butadiene and benzene the ethylene content is calculated according to the theoretical formula.

3.2 Reagents

3.2.1

deuteriochloroform, CDCl_3 (purity > 99.8%), containing 0.03% of tetramethylsilane (TMS) as the internal standard.

3.2.2

ethanol - toluene azeotrope (ETA).

3.2.3

acetone, AR.

3.3 Instrument

3.3.1 ^1H - NMR spectrometer, having a frequency of 150MHz or higher Fourier transform nuclear magnetic resonance (FT-NMR).

3.3.2

extraction, such as the ISO 1407.

3.3.3

vacuum oven, operating temperature is 50 °C ~ 60 °C.