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

GB/T 38271-2025

Replacing GB/T 38271-2019, GB/T 16867-1997

**Plastics - Determination of residual styrene monomer in polystyrene (PS),
impact-resistant polystyrene (PS-I), acrylonitrile-butadiene-styrene (ABS) and
styrene-acrylonitrile (SAN) resin - Gas chromatography**

塑料 聚苯乙烯 (PS)、抗冲击聚苯乙烯 (PS-I)、丙烯腈-丁二烯-苯乙烯 (ABS)
) 及苯乙烯-丙烯腈 (SAN) 树脂中残留苯乙烯单体含量的测定 气相色谱法

(English Translation)

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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 replaces GB/T 38271-2019 "Residual Styrene Monomer in Plastics Polystyrene (PS) and Impact-Resistant Polystyrene (PS-I)".

Determination of Benzene Content by Gas Chromatography and GB/T 16867-1997 "Residual Benzene in Polystyrene and Acrylonitrile-Butadiene-Styrene Resins" "Determination of Ethylene Monomer by Gas Chromatography" is based on GB/T 38271-2019 and integrates the content of GB/T 16867-1997.

Compared with GB/T 38271-2019, the main technical changes are as follows, apart from structural adjustments and editorial modifications.

a) The scope of the standard has been changed to include residual acrylonitrile-butadiene-styrene (ABS) and styrene-acrylonitrile (SAN) resins.

Determination of styrene monomer content (see Chapter 1, 2019 edition);

b) Typical retention times for styrene and other aromatic hydrocarbons have been changed (see Table 3, see Table 3 in the 2019 edition).

This document is modified to adopt ISO 2561:2023, "Plastics - Determination of polystyrene (PS) and impact-resistant polystyrene (PS-I) by gas chromatography".

The content of residual styrene monomer in the solution.

This document has undergone significant structural adjustments compared to ISO 2561:2023. A table comparing the structural numbering changes between the two documents is provided.

See Appendix A.

This document differs significantly from ISO 2561:2023. The relevant clauses are indicated in vertical single-line margins.

The lines (I) are marked. A summary of these technical differences and their reasons can be found in Appendix B.

The following editorial changes have been made to this document.

---The standard name has been changed to "Plastics Polystyrene (PS), Impact-Resistant Polystyrene (PS-I), Acrylonitrile-Butadiene-Styrene".

Determination of Residual Styrene Monomer Content in ABS and SAN Resins by Gas Chromatography;

---Added content on oscillating and dissolving samples (see note 8.1);

---Examples of modified gas chromatograms for styrene and other volatile aromatic hydrocarbons (see Figure C.1);

---The informative appendix "Correlation between the mass of aromatic hydrocarbons in typical standard solutions and the concentration of aromatic hydrocarbons in sample solutions" has been deleted (see below).

Annex B of ISO 2561:2023.

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 Plastics Standardization (SAC/TC15).

1 Scope

This document describes the determination of polystyrene (PS), impact-resistant polystyrene (PS-I), and acrylonitrile-butadiene-styrene by gas chromatography.

Methods for determining the residual styrene monomer content in ABS and styrene-acrylonitrile (SAN) resins.

---Method A. Solution method;

---Method B. Solution-precipitation method;

---C Method. Headspace Method.

This document applies to the determination of residual styrene monomer content in PS, PS-I, ABS, and SAN resins, and is also applicable to the simultaneous determination of

sample content.

The content of other volatile aromatic hydrocarbons in the medium.

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 2035 Plastics Terminology (GB/T 2035-2024, ISO 472:2013, NEQ) GB/T 12806 Laboratory glassware - Single-mark volumetric flasks (GB/T 12806-2011, ISO 1042:1998, NEQ) GB/T 12808 Laboratory Glassware - Single-mark Pipettes

3 Terms and Definitions

The terms and definitions defined in GB/T 2035 apply to this document.

4 Principles

The polymer sample was dissolved in a solvent containing an internal standard. After sample processing, the sample was injected into a gas chromatograph to allow styrene and other volatile organic compounds to dissolve.

Aromatic hydrocarbons were separated and quantitatively determined.

---Method A. The polymer solution is directly injected into the gas chromatograph.

---Method B. Add the precipitant to the polymer solution, and after the polymer precipitates, inject the supernatant into the gas chromatograph.

---C Method. The polymer solution is sealed and heated until gas-liquid equilibrium is reached, then the upper gas layer is injected into the gas chromatograph.

5 Reagents and Materials

Unless otherwise specified, all reagents are of analytical grade or higher.