

ICS 83.080.10

CCS G 31



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

GB/T 14520-2025

Replacing GB/T 14520-1993

**Determination of the residual styrene monomer content as well as the
content of other volatile aromatic hydrocarbons in the unsaturated
polyester resin-based reinforced plastics - Gas chromatography**

不饱和聚酯树脂基增强塑料中残留苯乙烯单体及其他挥发性芳烃含量的测定 气相
色谱法

(English Translation)

Issued on: August 29, 2025

Implemented on: March 1, 2026

Issued by: State Administration for Market Regulation

Table of Contents

Foreword
1 Scope
2 Normative references
3 Terms and Definitions
4 Principles
5 Materials

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 supersedes GB/T 14520-1993 "Determination of Residual Styrene in Unsaturated Polyester Reinforced Plastics by Gas Chromatography".

Compared with GB/T 14520-1993, the main technical changes in "Monomer Content" are as follows, except for structural adjustments and editorial modifications.

---The solvent has been changed (see 5.3, 4.1 in the 1993 edition);

---The material requirements for styrene have been changed (see 5.4, 4.4 in the 1993 edition);

---Added gas purity requirements (see 6.2.4);

---The dosage of n-butylbenzene has been changed (see 8.2, 6.2 of the 1993 edition);

---The calculation formula has been changed (see 9.1, 8.2 in the 1993 edition);

---Precision requirements have been changed (see 9.2, 8.4 of the 1993 edition);

---The typical operating conditions for the gas chromatograph have been changed (see Appendix A, 7.2 of the 1993 edition).

This document is modified to adopt ISO 4901:2011 "Determination of residual benzene by gas chromatography in reinforced plastics based on unsaturated polyester resins".

Content of ethylene monomer and other volatile aromatic hydrocarbons.

This document has undergone the following structural adjustments compared to ISO 4901:2011.

---Added 5.3;

---5.4 corresponds to 5.3 of ISO 4901:2011;

---6.2.4 corresponds to 5.4 of ISO 4901:2011; 6.2.5 corresponds to 6.3 of ISO 4901:2011;
6.2.6 corresponds to ISO 4901:2011.

Sections 6.4 and 6.3 correspond to section 6.5 of ISO 4901:2011.

The technical differences between this document and ISO 4901:2011, and the reasons therefor, are as follows.

---The phrase "not applicable to UP resins with good chemical resistance" has been removed (see Chapter 1), indicating an unclear definition of resin types;

---ISO 472 (see Chapter 3) has been replaced with the normatively referenced GB/T 2035 to adapt to my country's technical conditions;

---Acetone was added as an extractant (see 5.3) to adapt to my country's technical conditions and meet the actual needs of users;

---The normative reference GB/T 30430 (see 6.2.2) has been added to adapt to my country's technical conditions;

---The purity requirements for carrier gas, fuel gas, and combustion-supporting gas have been increased (see 6.2.4) to adapt to my country's technical conditions;

---ISO 1172 (see 8.4) has been replaced with the normatively referenced GB/T 2577 to adapt to my country's technical conditions.

The following editorial changes have been made to this document.

---In accordance with existing standards, the standard title has been changed to "Residual Styrene Monomers and Other Volatile Organic Compounds in Unsaturated Polyester Reinforced Plastics".

"Determination of Aromatic Hydrocarbon Content by Gas Chromatography";

---Note 5.2 has been deleted.

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 method of determining residual styrene monostyrene in cured unsaturated polyester resin-based reinforced plastics and their castings using gas chromatography.

Methods for determining body composition.

This document applies to unsaturated polyester resin-reinforced plastics and styrene and other volatile aromatic hydrocarbons in unsaturated polyester resin castings.

Measurement.

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 2577 Test method for resin content in glass fiber reinforced plastics (GB/T 2577-2005, ISO 1172:1996, MOD) GB/T 30430 Standard chromatographic columns for gas chromatograph testing

3 Terms and Definitions

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

4 Principles

Styrene or other volatile aromatic hydrocarbons are extracted from cured unsaturated polyester resins using dichloromethane or acetone. The styrene in the extract...

Alkenes or volatile aromatic hydrocarbons were determined by gas chromatography and quantified using the internal standard method.

5 Materials

Warning---Ingestion, inhalation, or skin absorption of dichloromethane is harmful and can affect the central nervous system, liver, cardiovascular system, and...

It can irritate the skin, eyes, and respiratory tract. It is also a suspected carcinogen; the risk of developing cancer depends on the degree and duration of exposure.

5.1

n-Butylbenzene, analytical grade, used as internal standard.

5.2

Dichloromethane, analytical grade, used as an extraction solvent.

5.3

Acetone, analytical grade, used as an extraction solvent.

5.4

Styrene, analytical grade. Other related aromatic hydrocarbons, such as toluene, ethylbenzene, and alpha-methylstyrene, are also analytical grade.

Note: If aromatics are used as solvents or raw materials in the UP resin production process, then it is considered relevant.