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

GB/T 12688.5-2019

Replacing GB/T 12688.5-2011

**Test method of styrene for industrial use - Part 5: Determination
of the content of total aldehydes - Titrimetric method**

工业用苯乙烯试验方法 第5部分：总醛含量的测定 滴定法

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Foreword

GB/T 12688 "Test method for industrial styrene" is divided into the following parts.

- Part 1. Determination of purity and hydrocarbon impurities - Gas chromatography;
- Part 3. Determination of polymer content;
- Part 4. Determination of peroxide content - Titration;
- Part 5. Determination of total aldehyde content - Titration;

---Part 8. Determination of the content of inhibitors (p-tert-butyl catechol) - Spectrophotometric method;

---Part 9. Determination of trace benzene by gas chromatography;

---Part 10. Determination of oxygenates - Gas chromatography. This part is the fifth part of GB/T 12688. This part is drafted in accordance with the rules given in GB/T 1.1-2009. This part replaces GB/T 12688.5-2011 "Test methods for industrial styrene - Part 5.

Determination of total aldehyde content law". In addition to the editorial changes in this section compared with GB/T 12688.5-2011, the main technical changes are as follows:

--- Increased potentiometric titration (see Chapter 5, Table 3). This part was proposed by the China Petroleum and Chemical Industry Federation. This part is under the jurisdiction of the National Chemical Standardization Technical Committee (SAC/TC63). This section was drafted. China Petrochemical Co., Ltd. Beijing Yanshan Branch, China Petroleum & Chemical Corporation Shanghai Stone Oil Chemical Research Institute, Guangdong Xinhua Yuehuade Technology Co., Ltd. The main drafters of this section. Yan Guiyi, Jiang Liancheng, Peng Zhenlei, Zeng Yuansen, Yu Hongjun, Hao Yazhen, Zhao Liang. The previous versions of the standards replaced by this section are.

---GB/T 12688.5-1990, GB/T 12688.5-2011. Industrial styrene test method Part 5. determination of total aldehyde content Caution - This section is not intended to describe all

of the security issues associated with its use. Users are responsible for establishing appropriate security and Health measures are guaranteed to comply with the relevant national regulations.

1 Scope

GB/T 12688.5-2019 is the Chinese national standard on test method of styrene for industrial use - part 5: determination of the content of total aldehydes - titrimetric method, in the field of chemical technology. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 4 June 2019 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 May 2020. Classification: ICS 71.080.15, CCS G16. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This part of GB/T 12688 specifies manual titration and potentiometric titration for the determination of total aldehyde content in industrial styrene. This section applies to the determination of styrene samples with a total aldehyde content of 10mg/kg~300mg/kg.

Note. The presence of ketones in the sample can interfere with the assay.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article. Pieces. For undated references, the latest edition (including all amendments) applies to this document. Preparation of

GB/T 601 chemical reagent standard titration solution

GB/T 3723 General rules for sampling safety of industrial chemical products General rules for sampling

GB/T 6678 chemical products

GB/T 6680 Liquid Chemical Product Sampling General

GB/T 6682 Analytical laboratory water specifications and test methods

GB/T 8170 Numerical Rounding Rules and Representation and Determination of Limit Values

3 Principle of the method

A methanol solution of hydroxylamine hydrochloride is added to the styrene sample, and

the active aldehyde in the sample reacts with hydroxylamine hydrochloride to form hydrochloric acid as follows: The amount is equivalent to the amount of aldehydes in the sample. $\text{RCHO} + \text{NH}_2\text{OH} \cdot \text{HCl} \rightarrow \text{RCHNOH} + \text{H}_2\text{O} + \text{HCl}$ The hydrochloric acid formed by the reaction was titrated with a sodium hydroxide or potassium hydroxide-methanol standard titration solution, and the total aldehyde content in the styrene was measured. Total aldehyde The content is calculated and reported in the form of benzaldehyde.

4 Method A

---Manual titration

4.1 Reagents and materials

4.1.1 Unless otherwise stated, the reagents used in this section shall be of analytical grade. The water used should meet the three-level water specification specified in GB/T 6682.

4.1.3 Hydrochloric acid solution [$c(\text{HCl})=$

0.025 mol/L].

2.08 mL of concentrated hydrochloric acid ($\rho=$

1.19 g/cm³) was removed and diluted to 1 L with water.

4.1.4 Sodium hydroxide standard titration solution [$c(\text{NaOH})=0.5\text{mol/L}$]. Prepare and calibrate according to GB/T 601 method.