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

GB/T 42238-2022

**Surface active agents - Determination of free propylene oxide
content in propylene oxide adduct surfactants - GC method**

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foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1. Structure and Drafting Rules for Standardization Documents" drafting.

This document is modified to adopt ISO 19619.2018 "Determination of Free Propylene Oxide in Surfactants Propylene Oxide Polymerized Surfactants

Fixed Gas Chromatography".

Compared with ISO 19619.2018, this document has made the following structural adjustments.

---5.1 corresponds to 5.2 in ISO 19619.2018, 5.2 corresponds to 5.3 in ISO 19619.2018, and 5.3 corresponds to ISO 19619.

5.4 and 5.4 in.2018 correspond to 5.5 in ISO 19619.2018.

The technical differences between this document and ISO 19619.2018 and their reasons are as follows.

--- Replace ISO 607 (see 8.1) with the normatively quoted GB/T 13173 to adapt to my country's technical conditions and improve operability;

--- Replace ISO 3696 with normatively quoted GB/T 6682 (see Chapter 5) to adapt to my country's technical conditions and improve operability

active.

The following editorial changes have been made to this document.

--- Deleted Appendix A (informative) and references in ISO 19619.

Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents.

1 Scope

This document describes a gas chromatographic method for the determination of free propylene oxide in multicomponent block copolymer surfactant products.

This document is applicable to the determination of free propylene oxide content in surfactant products that use polypropylene glycol structure substances as raw materials.

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text. Among them, dated references

For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to this document.

GB/T 6682 Analytical laboratory water specifications and test methods (GB/T 6682-2008, ISO 3696.1987, MOD)

GB/T 13173 Surfactant detergent test method (GB/T 13173-2021, ISO 607.1980, ISO 697.1981,

ISO 4313.1976, ISO 4321.1977, ISO 4325.1990, ISO 21264.2019, MOD)

3 Terms and Definitions

This document does not have terms and definitions that need to be defined.

4 principles

The target substance in the sample becomes gaseous and dissociated after being heated by the headspace sampling system and reaches thermal equilibrium.

Heating, separation by gas chromatography system, detection by hydrogen flame ionization detector, qualitative by retention time, or by mass spectrometry detector according to fragmentation

The relative abundance of sheet ions was used for qualitative analysis, and the external standard method was used for quantitative analysis.

5 Reagents and materials

Unless otherwise specified, only reagents confirmed to be analytically pure and water that meets GB/T 6682 grade 3 or above are used in the analysis.

5.1 The ethylene oxide stock solution of appropriate concentration can be prepared by any of the following methods.

- a) 1.0mg propylene oxide standard substance [purity $\geq 99\%$ (mass fraction)] was dissolved in 1mL acetonitrile and sealed in a sample bottle;
- b) A commercially available certified standard solution of propylene oxide with an appropriate concentration can also be used to simplify the preparation procedure and maintain the accuracy of the solution concentration,

For example, a standard solution of propylene oxide with a concentration of 1000 $\mu\text{g/mL}$ is prepared by dilution with a suitable solvent.

5.2 N,N-Dimethylacetamide (DMAC), $\text{C}_3\text{H}_7\text{NO}$, purity $\geq 99.9\%$.

DMAC can also be replaced by other more safe and convenient solvents.

Solvent suitability should be assessed by appropriate verification tests.

Possible alternatives include but are not limited to the following.