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

GB/T 46918.2-2025

**Fine bubble technology - Evaluation method for determining
gas content in fine bubble dispersions in water - Part 2:
Hydrogen content**

微细气泡技术 水中微细气泡分散体系气体含量的测量方法 第2部分：氢气含量
(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 is Part 2 of GB/T 46918 "Method for Measurement of Gas Content in Microbubble Dispersion Systems in Water Using Microbubble Technology".

GB/T 46918 has published the following parts.

---Part 1: Oxygen Content;

---Part 2: Hydrogen content.

This document is modified to adopt ISO 7383-2:2024 "Method for determination of gas content in microbubble dispersion systems in water using microbubble technology".

Part 2 of the law. Hydrogen content.

This document has undergone the following structural adjustments compared to ISO 7383-2:2024.

---Items a), b), and c) of 5.1.1 correspond to 5.1.1.1, 5.1.1.2, and 5.1.1.3 of 5.1.1 in ISO 7383-2:2024, respectively;

---Added version 5.1.3;

---5.1.4 corresponds to 5.1.3 in ISO 7383-2:2024;

---Items a), b), c), and d) in 5.2.1 correspond to 5.2.1.1, 5.2.1.2, 5.2.1.3, and 5.2.1.3 in ISO 7383-2:2024, respectively.

5.2.1.4;

--- 5.2.2 and 5.2.3 correspond to 5.2.2.1 and 5.2.2.2 in ISO 7383-2:2024, respectively;

---Sections 5.2.4 to 5.2.6 correspond to sections 5.2.3 to 5.2.5 in ISO 7383-2:2024, respectively;

---6.1.1 and 6.1.2 correspond to 6.1 in ISO 7383-2:2024;

---Removed 8.3 from ISO 7383-2:2024;

---Table A.1 corresponds to Table 1 in ISO 7383-2:2024;

---Appendices B, C, and D correspond to Appendices D, B, and C in ISO 7383-2:2024, respectively.

The technical differences between this document and ISO 7383-2:2024, and the reasons therefor, are as follows.

---The range has been modified (see Chapter 1). This method can also be used to measure the hydrogen content in microbubble dispersions to improve accuracy.

Operability;

--- Added GB/T 41914.1 and GB/T 41914.2 as reference documents in the introductory text of the "Terms and Definitions" chapter (see page 3).

(Chapter), to unify the source of terminology and avoid duplication;

---The term "dissolved hydrogen" (see 3.1 of ISO 7383-2:2024) has been removed and is not used in this document;

---The definition of the term "titration" has been changed (see 3.2) to improve operability;

---An instrumental balance for titration (see 5.1.3) has been added to improve operability;

---Change the refrigerator temperature to " $4^{\circ}\text{C}\pm 1^{\circ}\text{C}$ " (see 5.2.2) to define the allowable deviation range and improve operability and consistency;

---Change the freezer temperature to " $-20^{\circ}\text{C}\pm 1^{\circ}\text{C}$ " (see 5.2.3) to define the allowable deviation range and improve operability and...

To the point of being;

---Change the recommendation regarding "equipping gas chromatographs with thermal conductivity detectors" to a requirement (see 5.2.5);

---Added normative reference ISO 19430:2024 (see 5.2.6) to enhance comparability with international data; changed the nanoparticle...

For information on particle tracking analysis (NTA) instruments (see 5.2.6), avoid unnecessary equipment limitations; specify "measurement temperature approximately 15°C ".

The procedure has been changed to "perform at room temperature and record the actual temperature at the time of measurement" (see 5.2.6) to improve operability;

---The relevant sections on "Preparation of Methylene Blue Platinum Colloidal Reagent" and "Titration Measurement" in the titration method have been revised (see 6.1) to refine the operation.

Steps to improve operability;

---ISO 24261-2 (see 6.2.3) has been replaced with the normatively referenced GB/T 44626.2 to ensure consistency in freeze-thaw annealing procedures.

Sex; The clause 6.2.3 in ISO 7383-2:2024, "It is advisable to investigate by measuring the bubble number concentration with NTA before and after freeze-thaw cycles," has been deleted.

Eliminating "efficiency" recommendations does not change the methodological principles and is beneficial for implementation in laboratories at different levels.

---Added "The calibration curve is established using standard hydrogen gas, and the area of the hydrogen signal is converted to a percentage using the nonlinear equation of the calibration curve." Concentration (see 6.2.4) to clarify the data processing flow;

---The calculation formula and steps for titration have been added (see 7.1);

---Section 7.2.8 of ISO 7383-2:2024 has been deleted, and Table 1 therein has been moved from the main text to informative content (see Appendix A);

---The content related to "Uncertain Factors" (see Chapter 8) has been revised to adapt to my country's actual situation;

---The relevant content of the "Report" (see Chapter 9) has been revised to adapt to the actual situation in our country.

The following editorial changes have been made to this document.

---The note in the "Scope" chapter has been revised;

---Change "titration method (oxidation method)" to "titration method" in sections 5.1, 6.1, 7.1, and 8.1;

---Changed the title of section 5.2.6 to "Nanoparticle Tracking Analysis (NTA) Instruments"; removed the ZetaView trademark information;

---Added references to Appendix A (Comparison of Method Results) and Appendix C and Appendix D (Example Results of Capillary Columns/Packed Columns) in section 7.2.1.

The descriptions of Annexes C and D in section 7.2.7 of ISO 7383-2:2024 have been removed.

---Change the title of Appendix A to "Examples of Results for Determining Hydrogen Content in Microbubble Dispersions by Titration and Gas Chromatography";

---The coordinate scale and legend in Figure A.1 have been changed.

This document was proposed by the Chinese Academy of Sciences.

This document is under the jurisdiction of the National Technical Committee on Standardization of Microbubble Technology (SAC/TC584).

Introduction

Hydrogen has attracted attention in recent years from various fields such as medicine, agriculture, food, and environment due to its antioxidant properties, residue-free nature, and environmental friendliness.