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

GB/T 5275.2-2022

Replacing GB/T 5275.2-2014

**Gas analysis - Preparation of calibration gas mixtures using
dynamic methods - Part 2: Piston pumps**

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Table of Contents

Preface	
Introduction	
1 Scope	1
2 Normative references	1
3 Terms and Definitions	1
4 symbols	2
5 Principles and Equipment	3
5.1 Principle	3
5.2 Device	3
6 Preparation of mixed gas for calibration	5
6.1 Security considerations	5
6.2 Feasibility analysis of preparation of mixed gas	5
6.3 Preparation device and setting the gas mixture composition	6
6.4 Control of input pressure	6
6.5 Temperature control	6
6.6 Uniformity	6
6.7 Stability	6
6.8 Fluctuation of output pressure and flow	6
6.9 Composition of feed gas	7
7 Calculation of volume fraction and related uncertainty assessment	7
7.1 Calculation method A	7
7.2 Calculation method B	8
8 Verification of gas mixture composition	9
Appendix A (Normative) Quantity score of substances	10
A.1 Composition of mixed gas for calibration	10
A.2 Uncertainty assessment of the mass fraction of mixed gas substances	10
Appendix B (informative) Uncertainty assessment of mixed gases	11

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 part 2 of GB/T 5275. GB/T 5275 has issued the following parts.

- Part 1. Calibration method;
- Part 2. Piston pumps;
- Part 4. Continuous injection method;
- Part 5. Capillary calibrator;
- Part 6. Critical flow orifices;
- Part 7. Thermal mass flow controllers;
- Part 8. Diffusion method;
- Part 9. Saturation method;
- Part 10. Infiltration method;
- Part 11. Electrochemical generation method.

This document replaces GB/T 5275.2-2014 "Preparation of mixed gases for calibration by dynamic volumetric method for gas analysis - Part 2. Volume

Pump", compared with GB/T 5275.2-2014, except for structural adjustment and editorial changes, the main technical changes are as follows.

- Added the chapter "Terms and Definitions" (see Chapter 3);
- Added the chapter "Symbols" (see Chapter 4);
- Changed the content related to the principle and equipment (see Chapter 5, Chapter 3 and Chapter 4 of the 2014 edition);
- Added the chapter "Preparation of mixed gas for calibration" (see Chapter 6);
- Changed the calculation of volume fraction and related uncertainty assessment method (see Chapter 7, Chapter 5 of the 2014 edition);
- Added the chapter "Verification of the composition of mixed gases" (see Chapter 8);
- Added the calculation of the amount fraction of the substance and its uncertainty assessment method (see Appendix A);
- Increased calculation examples (see Appendix D).

This document identically adopts ISO 6145-2:2014 "Preparation of mixed gas for calibration by dynamic method of gas analysis - Part 2. Piston pump".

The following minimal editorial changes have been made to this document.

--- For the errata of ISO 6145-2:2014, the editorial changes made to the "References" and their reasons are shown in Appendix NA.

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

Introduction

The dynamic method is an important method for preparing mixed gases for calibration, and ISO has specially compiled the ISO 6145 series of standards for this purpose.

(ISO 6145-3 air flow intermittent injection method has been abolished).

GB/T 5275 (all parts) are equivalent to ISO 6145 series standards. Due to the length of the text, ISO 6145 is divided into 11 parts

points, GB/T 5275 is consistent with ISO 6145, and is also divided into 11 parts correspondingly. Since ISO 6145-3 has been abolished, GB/T 5275 No.

3 parts are also correspondingly vacant. GB/T 5275 (all parts) specifies the general requirements for the preparation of mixed gases for calibration by the dynamic method, and specifically

It specifies the principles, main equipment, preparation precautions, and prepared calibration gas mixtures of nine methods such as volumetric pump method.

The technical requirements for the calculation of the volume fraction of the mixed gas components and the evaluation of the uncertainty are to ensure the quality of the prepared mixed gas for calibration and improve the quality of the mixed gas.

High level of preparation of calibration gas mixtures.

GB/T 5275 (all parts) is intended for use by trained professionals with practical experience.

GB/T 5275 consists of 10 parts.

--- Part 1. Calibration method. It stipulates the basic information and applicability of each preparation method, precautions for operating the dynamic system, dynamic

The calibration method of the system, the calculation of components and uncertainty, and the verification method are the basis of the other 9 parts. purpose is

Provide a reasonable selection of one or more methods of preparing mixed gases for calibration and link these methods to national measurement standards

To establish the measurement traceability of the composition of the prepared mixed gas.

--- Part 2. Piston pumps. The purpose is to provide calibration equipment prepared from two or more pure gases or other mixed gases using a piston pump.

The method of mixed gas, and the calculation method and uncertainty evaluation of the content of each component in the prepared mixed gas for calibration

Way.

--- Part 4. Continuous injection method. The purpose is to provide continuous injection of pure gas or other mixed gas into the balance gas through the syringe.

A method for continuously preparing a calibration mixed gas containing two or more components, and the prepared calibration mixed gas

Calculation method and uncertainty evaluation method of the content of each component in the compound gas.

--- Part 5. Capillary calibrator. The purpose is to provide the use of equipment containing single or multiple capillary combinations from pure gases or

Method for continuously preparing mixed gas for calibration with mixed gas, and calculation of the content of each component in the prepared mixed gas for calibration

method and uncertainty assessment method.

--- Part 6. Critical flow orifices. The purpose is to provide the use of critical flow orifice by two or more pure gas or other used gas

A method for preparing a mixed gas for calibration by mixing, and a calculation method for the content of each component in the prepared mixed gas for calibration, and

Uncertainty assessment method.

--- Part 7. Thermal mass flow controllers. The purpose is to provide the use of thermal mass flow controllers connected by pure gas or mixed gas

The method for preparing the mixed gas for calibration, the calculation method of the content of each component in the prepared mixed gas for calibration and the different

Certainty assessment method.

--- Part 8. Diffusion method. The purpose is to provide a mixture of two or more pure gases or other used gases using the diffusion method

The method of preparing the mixed gas for calibration, and the calculation method of the content of each component in the prepared mixed gas for calibration and the uncertainty

Quantitative assessment method.

--- Part 9. Saturation method. The purpose is to provide a method for the continuous preparation of calibration mixtures from one or more easily condensable gases using the saturation method.

The method of mixing gas, and the calculation method and uncertainty evaluation method