

ICS 71.040.40

CCS G 86



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

GB/T 5274.1-2018

Replacing GB/T 5274-2008

**Gas analysis -- Preparation of calibration gas mixtures -- Part 1:
Gravimetric method for class I mixtures**

Issued on: September 17, 2018

Implemented on: April 1, 2019

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

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Foreword

GB/T 5274 "Preparation of mixed gas for gas analysis and calibration" is divided into the following two parts.

--- Part 1. Preparation of a first-stage mixed gas by weighing method;

--- Part 2. Weighing method to prepare a second mixed gas.

This part is the first part of GB/T 5274.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This part replaces GB/T 5274-2008 "Preparation and weighing method for gas mixture for gas analysis and calibration", and GB/T 5274-2008

In comparison, the main technical content changes are as follows.

--- The standard name was changed to "Preparation of mixed gas for gas analysis and calibration - Part 1. Preparation of first-stage mixed gas by weighing method";

--- Deleted the directory (see the.2008 edition of the directory);

--- Revised scope (see Chapter 1, Chapter 1 of the.2008 edition);

--- Revised the normative reference document (see Chapter 2, Chapter 2 of the.2008 edition);

--- Added terms and definitions (see Chapter 3);

--- Added symbols and codes (see Chapter 4);

---Modified principles (see Chapter 5, Chapter 3 of the.2008 edition);

--- Modified the mixed gas preparation plan (see Chapter 6, Chapter 4 of the.2008 edition);

--- Added purity analysis (see Chapter 7);

--- Revised the calculation method of uncertainty (see Chapter 8, Chapter 5 of the.2008 edition);

- Increased the requirements for uniformity and stability of the calibration mixture (see Chapter 9);
- Revised the requirements for verification of the composition of the calibration gas mixture (see Chapter 10, Chapter 6 of the.2008 edition);
- Increased the uncertainty of calibration of the mixed gas and the requirements for the preparation of the certificate (see Chapter 11);
- Removed the test report (see Chapter 7 of the.2008 edition);
- Modified precautions when weighing, handling and filling cylinders (see Appendix A, Appendix C of the.2008 edition);
- Modified the example (see Appendix B, Appendix A of the.2008 edition);
- Revised the filling pressure estimation guidelines to avoid condensation of condensable components in the mixture (see Appendix C, Appendix B of the.2008 edition);
- Increased the method of adding liquid (see Appendix D);
- Increased relative atomic mass and molar mass (see Appendix E);
- Revised the derivation of the calibration mixture composition formula (see Appendix F, Appendix D of the.2008 edition);
- Increased the sensitivity factor for the calculation of component mole fraction uncertainty (see Appendix G);
- Revised the derivation process of the calculation formula for the final weighing uncertainty of the calibration gas mixture (see Appendix H, Appendix F of the.2008 edition);
- Removed sources of error (see Appendix E of the.2008 edition);
- Removed the computer calculation program for the recommended method (see Appendix G of the.2008 edition).

This section uses the translation method equivalent to ISO 6142-1.2015 "Preparation of gas mixtures for gas analysis and calibration - Part 1.

Preparation of first-stage mixed gas by volume method.

The documents of our country that have a consistent correspondence with the international documents referenced in this part are as follows.

- GB/T 14850-2008 Gas Analysis Glossary (ISO 7504.2001, IDT)
- GB/T 10628-2008 Gas analysis and calibration of mixed gas composition determination and verification comparison method (ISO 6143.2001, IDT)
- GB/T 35860-2018 Gas Analysis and Calibration Mixed Gas Certificate Content (ISO

6141.2015, IDT)

---GB/T 35530-2017 Mixture gas weighing preparation component correlation control (ISO /T S29041.2008, IDT)

This standard has made the following editorial changes.

--- Change the illegal unit of measurement "Da" to "u".

This part was proposed by the China Petroleum and Chemical Industry Federation.

This part is under the jurisdiction of the National Gas Standardization Technical Committee (SAC/TC206).

This section drafted by. Southwest Chemical Research and Design Institute Co., Ltd., China Testing Technology Research Institute, Zhonghao Guangming Chemical Research and Design Institute

Co., Ltd., Dalian Date Co., Ltd., Hangzhou New Century Mixed Gas Co., Ltd., China Institute of Metrology, Beijing Yupu North Sub-gas

Industrial Co., Ltd.

1 Scope

This part of GB/T 5274 specifies a method for preparing a bottled calibration mixture by weighing, one or more of the calibration gas mixture.

The amount fraction (molar fraction) of the substance of each component can be traced back to the source. This section also specifies the calculation method for the uncertainty of the mole fraction of each component.

Method, the uncertainty calculation needs to evaluate the uncertainty contribution of the following factors, including. weighing process, component purity, mixture

The stability of the body and the verification of the final mixed gas.

This section applies only to the preparation of a mixed gas of gaseous or fully vaporizable components, which can be introduced into the cylinder in a gaseous or liquid state. this

Part of the preparation of binary or multi-component gas (including natural gas) is covered. This section does not include multiple mixed gas batch processes in a single process.

The method of preparation.

In order to determine the shelf life of the mixed gas (maximum storage period), this section specifies the method of stability evaluation, but this method does not apply to

Evaluation of the stability of components that react with each other. This section also specifies each raw material (gas or liquid) used to prepare the mixed gas.

Methods for quantitative analysis and evaluation of impurities in the process.

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.

ISO 6141 Gas Analysis Calibration Mixed Gas Certificate Content
(Gasanalysis-Contentsofcertificatesforcali-

Breakgasmixtures)

ISO 6143 Gas Analysis Calibration for the determination and calibration of mixed gas
compositions (Gasanalysis-Comparison)

Methodsfordeterminingandcheckingthecompositionofcalibrationgasmixtures)

ISO 7504 Gas Analysis Glossary (Gasanalysis-Vocabulary)

ISO 14912 Gas Analysis Conversion of Mixture Gas Content (Gasanalysis-Conversion of
Gasmixture

Compositiondata)

ISO 16664.2004 Gas Analysis Guide for the Use of Calibration Gases and Mixed Gases
(Gasanalysis-Handlinganduse

Ofcalibrationgasesandgasmixtures-Guidelines)

ISO 19229 Gas Analysis Purity Analysis and Purity Data Processing
(Gasanalysis-Purityanalysisandthe

Treatmentofpuritydata)

ISO /T S29041 Mixed Gas Weighing Method for Component Correlation Control
(Gasmixtures-Gravimetricprepara-

tion-Masteringcorrelationsincomposition)

ISO /IEC Guide 98-3 Measurement uncertainty - Part 3. Guide to measurement uncertainty
(GUM..1995) (Uncertainty

ofmeasurement-Part 3. Guidetotheexpressionofuncertaintyinmeasurement)

The relative atomic mass of an element [International Union of Theoretical and Applied
Chemistry (IUPAC) Commissiononatomicweights

Andisotopicabundances. Atomicweightsoftheelements]