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

GB/T 27894.2-2020

Replacing GB/T 27894.2-2011

**Natural gas - Determination of composition and associated
uncertainty by gas chromatography - Part 2: Uncertainty
calculations**

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Foreword

GB/T 27894 is divided into the following 6 parts.

---GB/T 27894.1 Gas Chromatography Determination of Composition and Calculation of Related Uncertainties Part 1.General Guidelines and

Composition calculation;

---GB/T 27894.2 Gas chromatographic determination of natural gas composition and calculation of related uncertainties. Part 2.Uncertainty

Calculation;

---GB/T 27894.3 Determination of the composition of natural gas by gas chromatography under a certain degree of uncertainty Part 3.Filling with two

The column measures hydrogen, helium, oxygen, nitrogen, carbon dioxide and hydrocarbons up to C8;

---GB/T 27894.4 Determination of composition of natural gas by gas chromatography under a certain degree of uncertainty Part 4.Laboratory and in

Two chromatographic columns are used in the line measurement system to determine nitrogen, carbon dioxide and hydrocarbons from C1 to C5 and C6;

---GB/T 27894.5 Determination of the composition of natural gas by gas chromatography under a certain degree of uncertainty Part 5.Laboratory and in

Three chromatographic columns are used in the in-line process system to determine nitrogen, carbon dioxide and C1 to C5 and C6 hydrocarbons;

---GB/T 27894.6 Determination of composition of natural gas by gas chromatography under a certain degree of uncertainty. Part 6. Use three capillaries

The column measures hydrogen, helium, oxygen, nitrogen, carbon dioxide and C1 to C8 hydrocarbons.

This part is Part 2 of GB/T 27894.

This section was drafted in accordance with the rules given in GB/T 1.1-2009.

This part replaces GB/T 27894.2-2011 "Determination of composition of natural gas by gas chromatography under certain uncertainty, Part 2

Minutes. Characteristics of Measurement Systems and Mathematical Statistics. Compared with GB/T 27894.2-2011, the main technical changes in this part are as follows.

---Modified the scope and deleted the processing of measurement system analysis data (see Chapter 1, Chapter 1 of the.2011 edition);

---Added terms and definitions (see Chapter 3, Chapter 3 of the.2011 edition);

---Deleted the calculation test program, added the calculation of uncertainty (see Chapter 5, Chapter 5 of the.2011 edition);

---The critical value t is deleted, and the uncertainty calculation of the component after the methane subtraction method is added (see Appendix A, .2011 edition

Appendix A);

---The relative response factor data has been deleted, and the uncertainty calculation method of the unknown quantity has been added (see Appendix C, Appendix of the.2011 edition

C);

---Modified the informative appendix to the normative appendix, deleted the example, and increased the uncertainty of the relative response factor (see Appendix B,

Appendix B of the.2011 edition).

The translation method used in this part is equivalent to ISO 6974-2.2012 "Natural Gas Chromatography Determination of Composition and Calculation Related Uncertainties

Degree Part 2. Uncertainty Calculation". Chinese documents that have a consistent correspondence with the international documents cited in this section

as follows.

---GB/T 27894.1-2020 Gas Chromatography Determination of Composition and Calculation of Uncertainty Related to Natural Gas Part 1.Total

Guidelines and composition calculation (ISO 6974-1.2012, IDT);

---GB/T 27418-2017 Measurement Uncertainty Evaluation and Expression (ISO /IEC Guide 98-3.2008, MOD).

This section has made the following editorial changes.

--- Amend "ISO 6974-3" in the reference to "ISO 6974-3.2000";

--- Amend the "ISO 6974-5" in the reference to "ISO 6974-5.2000".

This part was proposed and managed by the National Natural Gas Standardization Technical Committee (SAC/TC244).

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Sales branch, China Institute of Metrology, China National Petroleum Corporation, natural gas quality control and energy metering key practices

Laboratory.

Introduction

ISO 6974 provides natural gas analysis methods and methods for calculating component mole fractions and uncertainties. ISO 6974 (all parts)

It is used to determine H₂, He, O₂, N₂, CO₂ and hydrocarbon compounds as a single component or a group of components, such as C₅ or more (without

C₅) All hydrocarbon compounds are defined as C₆. This method is suitable for calibrating gas mixture, calorific value of gas and calculation of other physical parameters

Provide gas composition data and uncertain data, etc. ISO 6974-3.2000 and subsequent parts detail specific application methods.

ISO 6974-1 specifies the use of gas chromatography as described in ISO 6974-3.2000 and subsequent sections to determine the composition of natural gas and calculate the friction.

General guidelines for the score. ISO 6974-1 also gives all the basic steps to establish an analysis method, including an overview of the analysis structure and determining the work

Scope and establish analysis procedures.

This part of GB/T 27894 gives the uncertainty of using gas chromatography to determine

the composition of natural gas and calculate the component mole fraction.

step.

ISO 6974-3.2000 and subsequent parts give different gas chromatography analysis methods, including daily laboratory analysis and online process

application. Appendix A of ISO 6974-1.2012 gives a comparison of the analysis methods of ISO 6974-3.2000 and subsequent parts.

This part of GB/T 27894 should be used in conjunction with the subsequent parts of ISO 6974-1 and ISO 6974 (such as ISO 6974-3..2000

Wait).

5.5 in ISO 6974-1.2012 gives a conventional normalization method for obtaining the processed mole fraction from the original mole fraction. for

For the multiple operation method without bridging component, the uncertainty result calculated by conventional normalization is conservative. If you need to do more accurate

For certainty assessment, generalized least squares (GLS) can be used instead of the normalization method, which is given in Appendix B of ISO 6974-1.2012

Out. In addition, there are other methods to calculate the processed mole fraction, such as the methane subtraction method (refer to ISO 6974-1.2012 Appendix C) and the number

According to the coordination method [1].

Determination of composition and calculation of natural gas by gas chromatography

Related uncertainty

Part 2.Uncertainty calculation

1 Scope

This part of GB/T 27894 gives the uncertainty evaluation process for the mole fraction of each component in natural gas analysis. This part and

GB/T 27894.1 is used in combination.

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this article

Pieces. For undated reference documents, the latest version (including the amendments used) applies to this document.

ISO 6974-1.2012 Gas Chromatographic Determination of Natural Gas and Calculation of