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

GB/T 5275.4-2014

**Gas analysis -- Preparation of calibration gas mixtures using
dynamic volumetric methods -- Part 4: Continuous syringe
injection method**

气体分析 动态体积法制备校准用混合气体 第4部分：连续注射法

(English Translation)

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Foreword

GB/T 5275 "gas analysis dynamic volume Preparation of calibration gas mixtures" is divided into the following sections.

- Part 1. calibration method;
- Part 2. positive displacement pump;
- Part 4. continuous injection;
- Part 5. Capillary calibration devices;
- Part 6. Critical orifices;
- Part 7. Thermal mass flow controller;
- Part 8. Diffusion method;
- Part 9. Saturation method;
- Part 10. Permeation;
- Part 11. Electrochemical method occurs.

This section GB/T 45275 Part of.

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

This section uses the translation method identical with ISO 6145-4:2004 "gas analysis dynamic volume Preparation of calibration gas mixtures 4th Part I. Continuous injection method. " Consistency correspondence between this part of international documents and normative references of our files are as follows.

--- GB/T 10628-2008 gas analysis calibration gas mixture composition measurements and comparison test (ISO 6143:2001, IDT);

--- GB/T 5275.1-2014 gas analysis equipment dynamic volume Method of calibration gas mixtures - Part 1. calibration method (ISO 6145-1:2003, IDT).

This part is proposed by the China Petroleum and Chemical Industry Association.

This part of the National Gas Standardization Technical Committee (SAC/TC206) centralized.

This section drafted by. China Institute of Metrology, Southwest Chemical Industry Research and Design Institute Co., Ltd., Beijing helium gas industry has divided the North Cape Limited, the Ministry of Environmental Protection Institute of the standard sample.

1 Scope

GB/T 5275 provisions of this section from a pure gas or gas mixture through a syringe to the other balance calibration gas is continuously injected components, from Continuously prepared containing two or more components of the gas mixture with the calibration methods.

Use premixed gas instead of pure gas (see Appendix A) can be prepared in a mixed gas volume fraction low. Determine the volume fraction of the volume flow, by a single flow of gas is calculated, it may also be an appropriate method of independent measurements given in ISO 6145-1.

Advantage of continuous injection law can be prepared continuously large number of mixed gas, and as long as the appropriate number of syringes or single syringe Known multi-component gas mixture containing the gas can be as prepared as easily as binary mixtures prepared multi-component gas mixture. The method may further by a few steps and easily increase calibration components in a mixed gas volume fraction. Therefore, it can be used to evaluate a gas analyzer Some other features, such as the limit of detection, blind and accuracy. Binary mixed gas prepared by the method (coverage factor $k = 2$) relative expanded Uncertainty of 5%, the scope of 10⁻⁵ to 10⁻² (volume fraction).

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document.

ISO 6143 Gas analysis calibration gas mixture composition measurements and check Comparative Law (Gasanalysis-Comparison methodsfordeterminingandcheckingthecompositionofcalibrationgasmixtures) ISO 6145-1 Gas analysis dynamic volume Preparation of calibration gas mixtures - Part 1. calibration method (Gasanalysis-Preparationofcalibrationgasmixturesusingdynamicvolumetricmethods-Part 1. Methodsofcali-bration) Principle 3 Component calibration gas or liquid phase by syringe into the capillaries and then into the gas stream balance, the capillary can be a needle injection device Vials, syringes, pistons driven by a suitable variable speed motor.

A component in the gas mixed with the balance gas volume fraction $\phi_{A/B}$ by the formula

(1) is given by.

$\phi_A = q_A / (q_A + q_B)$ (1) where.

q_A --- calibration component A volume flow;

Gas volume flow q_B --- balance of B.

If the calibration component is injected as a liquid, the gas flow rate after the volatile by the formula (2) is given by.

$q_A = (q_A, l \times \rho_A, l) / \rho_A, g$ (2) where.

q_A, l --- injection volume flow rate of liquid, which is the same unit of measure q_A ;