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NATIONAL METROLOGY TECHNICAL SPECIFICATION OF THE

PEOPLE'S REPUBLIC OF CHINA

# JJF 1953-2021

# Calibration Specification for Gas Chromatographs with Sulfur Chemiluminescence Detector

硫化学发光检测器气相色谱仪

(English Translation)

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# Table of Contents

Introduction (II)
1 Scope(1)
2 References (1)
3 Overview(1)
4 Metrology Characteristics(1)
5 Calibration Conditions(2)
5.1 Environmental conditions (2)
5.2 Measurement standards and other equipment(2)
6 Calibration items and calibration methods (2)
6.1 Oven temperature stability(3)
6.2 Temperature programmed repeatability(3)
6.3 Baseline Noise and Baseline Drift(3)
6.4 Detection limit(3)
6.5 Linearity error(5)
6.6 Overall performance (retention time, peak area repeatability) (5)
7 Calibration results (5)
8 Recalibration interval(6)
Appendix A Calibration Record Format(7)
Appendix B Calibration Certificate Inside Page Format (9)
Appendix C Calculation of Slope and Intercept in Linear Regression Method(10)
Appendix D Example of Uncertainty Assessment for Limits of Detection (11)

## 8 Recalibration interval(6)

Appendix A Calibration Record Format(7)

Appendix B Calibration Certificate Inside Page Format (9)

Appendix C Calculation of Slope and Intercept in Linear Regression Method(10)

Appendix D Example of Uncertainty Assessment for Limits of Detection (11)



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## Introduction

JJF 1071 "Rules for the Compilation of National Metrology Calibration Specifications", JJF 1001 "General Metrology Terms and Definitions" and JJF 1059.1 "Assessment and Representation of Measurement Uncertainty" together constitute the basic series of regulations supporting the formulation of this specification.

Fan. This specification refers to the technical requirements and test methods of JJG700-2016 "Gas Chromatograph" in the formulation.

This specification is published for the first time.

Sulfur Chemiluminescence Detector Gas Chromatograph Calibration Specifications

1 Scope

This specification applies to the calibration of sulfur chemiluminescence detector (SCD) gas chromatographs.

2 Reference documents this specification references the following documents.

JJG700-2016 Gas Chromatograph for dated references, only the dated version applies to this specification; for undated references the latest version (including all amendments) applies to this specification.

3 Overview

The gas chromatograph uses the carrier gas to bring the sample into the chromatographic column, and uses the components in the sample to gas and fix in the chromatographic column.

The distribution and adsorption coefficients of the phases are different, and the separation is carried out by a detector. According to the retention time of each component and response values for qualitative and quantitative analysis. The gas chromatograph consists of a gas system, a sample injection system, a separation system, and a temperature control system.

system, detection system and data processing system.

Sulfur chemiluminescence detector gas chromatograph (hereinafter referred to as the instrument) is used for industrial gases, natural gas, liquefied gas, Determination of sulfide and total sulfur in coke oven gas, gasoline, diesel and other samples.

The instrument detection system is mainly composed of combustion chamber, reaction chamber, ozone generator and related gas paths. Sulfur in the sample the compound (RS) is separated by a gas chromatographic column and then enters a sulfur chemiluminescence detector, where it is formed by combustion under hydrogen-rich conditions.



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Sulfur monoxide (SO) and other products, sulfur monoxide (SO) react with ozone (O3) to generate excited state SO2* and SO2* emit characteristic light signals when they return to the ground state. The main reaction mechanism is as follows.

RS O2->SO Other products SO O3->SO*2 O2 SO*2->SO2 hnu (300nm~400nm) where.

RS---Sulfide;

SO*2---excited sulfur dioxide;

hnu---light energy.

The intensity of the light signal is proportional to the content of sulfur in the sample, and can be calculated by comparing the intensity of the emitted light with the standard material.

Calculate the sulfur content in the sample.

4 Metrology characteristics refer to Table 1 for the reference index of instrument measurement performance.



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