

ICS 13.310
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**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GA/T 2075.3-2023

**Forensic sciences - Examination methods for common ignitable
liquid and its residues - Part 3: Thermo desorption-GC/MS**

法庭科学 常见易燃液体及其残留物检验 第3部分:热脱附-气相色谱/质谱法

(English Translation)

Issued on: March 1, 2023

Implemented on: December 1, 2023

Issued by: Ministry of Public Security

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents" Drafting.

This document is Part 3 of GA/T 2075 "Examination of Common Flammable Liquids and Their Residues in Forensic Science". GA/T 2075 has been the following sections were published.

---Part 1: Solvent extraction - gas chromatography/mass spectrometry;

---Part 2: Purge and Trap-Gas Chromatography/Mass Spectrometry;

---Part 3: Thermal Desorption-Gas Chromatography/Mass Spectrometry.

Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents.

Introduction

Fire-related cases seriously endanger people's lives and social stability. In the field of forensic science and fire investigation, the analysis of fire residues Analysis is an important part. The establishment of systematic and standardized technical standards is conducive to improving the field of forensic science involving flammable liquids and their residues in fire cases.

Maintain the standardization, relevance and mutual recognition of results of physical and chemical inspections.

GA/T 2075 "Inspection of Common Flammable Liquids and Their Residues in Forensic Science" technical system plan is divided into five parts, and with the technology the gradual improvement will be released one after another.

---Part 1: Solvent Extraction - Gas Chromatography/Mass Spectrometry. This document applies to gasoline, kerosene, diesel and other chemicals used in forensic science.

Inspection of other flammable liquids and their residues.

---Part 2: Purge and Trap-Gas Chromatography/Mass Spectrometry. This document applies to gasoline, kerosene, and other common Inspection of flammable liquids (such as paint thinner) and their residues.

---Part 3: Thermal Desorption-Gas Chromatography/Mass Spectrometry. This document applies to gasoline, kerosene, diesel and other Inspection of common flammable liquids (such as paint thinner) and their residues.

---Part 4: Forensic Science Gasoline Residue Extraction Testing Solid Phase Microextraction-Gas Chromatography-Mass Spectrometry. This standard has been Released and implemented in 2018, the standard number is GA/T 1515-2018, which is suitable for the inspection of gasoline in the field of forensic science. along with with the continuous development of technology and applications, it is planned to revise this standard and classify it into "Common flammable liquids and their residues in forensic science".

Part 4 of the Technical Specifications for Physical Inspection.

---Part 5: Technical Guidelines for Inspection of Flammable Liquids and Their Residues. This document applies to flammable liquids commonly found in forensic science and technical process specification guidance for physical and chemical testing of residues.

These five parts complement each other to form a complete technical system, which provides a basis for the analysis of flammable liquids and their residues in forensic science fire-related cases.

Chemical inspection provides normative guidance.

Forensic science testing of common flammable liquids and their residues Part 3: Thermal Desorption-Gas Chromatography/Mass Spectrometry

1 Scope

This document specifies the thermal desorption-gas chromatography/mass spectrometry test methods for gasoline, kerosene, diesel and their residues in the field of forensic science.

This document is applicable to the detection of gasoline, kerosene, diesel and other common flammable liquids (such as paint thinner) and their residues in the field of forensic science.

It can be used as a reference in other fields.

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, the dated quotations for undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to this document.

GB/T 14666 Analytical Chemistry Terminology GB/T 19267.7 Physical and chemical examination of criminal technical trace evidence Part 7: Gas chromatography-mass spectrometry GB 30000.7 Specifications for Classification and Labeling of Chemicals Part 7: Flammable Liquids GA/T 242 Terminology for physical and chemical examination of trace evidence in forensic science

3 Terms and definitions

The terms and definitions defined in GB/T 14666, GB/T 19267.7, GB 30000.7 and GA/T 242 apply to this document.

4 Principles

Common flammable liquids such as gasoline, kerosene, and diesel are volatile. After burning, some components will remain in the fire residue. Generally, there will be the relative content of light components decreases or even disappears, while the relative content of heavy components increases. Use adsorption tubes filled with adsorption materials to adsorb rich the flammable liquid and its residual components in the sample are collected, and the adsorption tube is heated and desorbed by a thermal desorption instrument, and the adsorbed flammable liquid components are introduced into the cold trap, and then rapidly heat the cold trap to cause the desorbed flow to enter the gas chromatograph-mass spectrometer (GC-MS) for detection.

5 Reagents and materials

Reagents and materials include.

- a) TenaxTA adsorption tube or other material adsorption tube with the same adsorption efficiency;
- b) Tinplate cans or tinplate cans with adsorption tube connections (or other pressure-resistant metal sealed cans);
- c) Nylon film bag or nylon film bag with adsorption tube connection port;
- d) Qualitative filter paper;

e) Microsyringe (10 μ L);

f) Comparison sample. gasoline, kerosene, diesel or other flammable liquids.