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

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**Technical determination methods for electrical fire evidence -
Part 7: Component analytic method of energy dispersive
spectrometry**

电气火灾痕迹物证技术鉴定方法 第7部分:EDS成分分析法

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part

1. Structure and Drafting Rules of Standardization Documents" Drafting. This document is the seventh part of GB/T 16840 "Technical Appraisal Method for Electrical Fire Trace Evidence". GB/T 16840 has been released The following parts.

2. Remanence detection method;

3. Auger analysis method;

4. Metallographic Analysis;

5. Identification and extraction methods of electrical fire material evidence;

---Part 6: SEM microscopic morphology analysis method;

---Part 7: EDS component analysis method;

8. Thermal analysis method. Please note that some of the contents of this document may involve patents. The issuing agency of this document is not responsible for identifying patents. This document was proposed by the Ministry of Emergency Management of the People's Republic of China. This document is under the jurisdiction of the National Fire Standardization Technical Committee (SAC/TC113). This document was drafted by: Shenyang Fire Research Institute of the Ministry of Emergency Management, Tianjin Fire

Research Institute of the Ministry of Emergency Management, and Sichuan Fire Protection of the Ministry of Emergency Management Research Institute, Shanghai Fire Research Institute of Emergency Management Department. The main drafters of this document. Zhang Ming, E Dazhi, Xia Dawei, Di Man, Gao Wei, Zhang Bin, Wang Lifan, Cao Liying.

The identification of electrical fire evidence is an important part of the investigation of the cause of fire by emergency rescue and firefighting agencies, especially when it is accompanied by national The improvement of the legal system of the family, the enhancement of citizens' awareness of the legal system, the identification of physical evidence has been used as strong evidence for the identification of the cause of the fire, and it is a fire rescue agency. The determination of the cause of the fire provides scientific, fast and accurate technical support. In this regard, my country has established a technology for evidence of electrical fire traces. National standard system for identification methods. In this standard system, GB/T 16840 "Technical Appraisal Method for Electrical Fire Trace Material Evidence" is a guide for me The method and basis for the relevant agencies of the country to engage in the identification of electrical fire evidence is planned to consist of eight parts, and the purpose is to establish Trace physical evidence for macro analysis, remanence analysis, Auger analysis, metallographic analysis, physical evidence identification and extraction, SEM microscopic morphology analysis, and component analysis And the method and basis for thermal analysis.

2.Remanence detection method.

3.Auger analysis method.

4.Metallographic Analysis Method.

5.Identification and extraction methods of electrical fire material evidence.

1 Scope

GB/T 16840.7-2021 is the Chinese national standard on technical determination methods for electrical fire evidence - part 7: component analytic method of energy dispersive spectrometry, in the field of environment and health protection, safety. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 20 August 2021 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 20 August 2021. Classification: ICS 13.220.20, CCS C80/89. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies the principle and instrument design of the EDS (X-ray energy

spectrometer) component analysis method in the technical identification method for electrical fire traces. Preparation of equipment and inspection materials, inspection and results of inspection materials. This document is applicable to the field of fire material evidence identification to test the elemental composition and content of the trace material. The traceability and identity comparison analysis of the element.

2 Normative references

The contents of the following documents constitute the indispensable clauses of this document through normative references in the text. Among them, dated quotations Only the version corresponding to that date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to This document.

GB/T 13966 Terminology for analytical instruments

GB/T 19267.6 Physical and Chemical Examination of Trace Material Evidence in Criminal Technology Part

3 Terms and definitions

The terms and definitions defined in GB/T 13966, GB/T 19267.6, GB/T 20162, and the following terms and definitions apply to this document.

3.1 EDS component analysis method componentanalytic method of energydispersive spectrometry Use a particle beam with a certain energy and intensity to bombard the sample material, according to the energy and intensity of the X-rays excited or reflected by the sample material. The relationship diagram of degree (called energy spectrum) realizes the method of non-destructive element analysis, structure analysis and surface physical and chemical characteristics analysis of the sampled materials.

3.2 Microcosmic composition The elemental composition and content in the area of several micrometers to tens of micrometers on the evidence.

4 Principle

The same elements contained in the trace evidence at the fire scene, regardless of their state, emit characteristic X-rays that have the same characteristics. The same energy. Measure the intensity of characteristic X-rays of fire traces as the basis of quantitative analysis; it can be divided into quantitative analysis with standard samples and determination without standard samples. Two kinds of quantitative analysis. When there is a standard sample to analyze the sample, the measured X-ray intensity of each element in the sample is compared with the spectral line intensity of the same name of the standard sample. In contrast, after background correction and matrix correction, the absolute content can be calculated more accurately; when there is no standard sample quantitative analysis,

the same name or the same name or The measured intensities of different spectral lines are compared with each other, and their relative content is calculated after background correction.

6 Scanning Electron Microscope/X-ray Energy Spectrometer

GB/T 20162 Fire technology appraisal material evidence extraction method

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