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

GB/T 47164-2026

**Determination of aluminium, magnesium, potassium and barium in
pyrotechnic compositions for fireworks and firecrackers - Inductively
coupled plasma optical emission spectrometry**

烟花爆竹用烟火药中铝、镁、钾和钡含量的测定 电感耦合等离子体发射光谱（IC
P-OES）法

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Standardization Administration of the PRC**

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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 was proposed by the China National Light Industry Council. This document is under the jurisdiction of the National Technical Committee on Standardization of Fireworks and Firecrackers (SAC/TC149). This document was drafted by: Nanning Customs Technology Center, Beihai Public Inspection and Testing Center, Beihai Product Quality Inspection Institute, and Guangxi Science and Technology Department. University. The main drafters of this document are. Wu Junyi, He Jinfeng, Yu Huiqun, Wu Qianhua, Zhang Xuan, Chen Hongcai, Tang Lichang, Luo Haichun, and Ye Youfang. Wu Guoyi, Wu Rui, Huang Juan, Zhang Quan.

Firework powder is a core component of fireworks products, and its content of aluminum, magnesium, potassium, and barium directly affects the flammability of the product. Burning stability, optical color effect, and safety performance. Currently, the industry lacks a unified method for simultaneous multi-element determination, leading to inconsistent results from different testing institutions. The results are not comparable and cannot meet the needs of production control, quality supervision and import and export inspection. To address the aforementioned issues, standardize testing procedures, and ensure the quality and safety of fireworks and firecrackers, this document specifies the use of inductive... The content of aluminum, magnesium, potassium, and barium in pyrotechnic agents and raw materials

was determined by intracytoplasmic plasma optical emission spectrometry (ICP-OES). Specifically, the content of aluminum and magnesium was... The testing method involves invention patent number ZL201410096991.8, and the patentee has committed to conducting the testing in a fair, reasonable, and non-discriminatory manner. (FRAND) principle provides for patent implementation licensing, and relevant licensing conditions can be obtained from the National Technical Committee on Standardization of Fireworks and Firecrackers (SAC/TC). 149) or obtained by the patentee. The purpose of this document is to provide the industry with scientific, accurate, and unified testing standards and to promote the standardized management of fireworks and firecracker product quality. The issuing organization of this document draws your attention to the fact that declarations conforming to this document may involve relevant patents related to the content in Chapters 5 and 6. The use of. The issuing organization of this document makes no position on the authenticity, validity, or scope of the patent. The patent holder has committed to the issuing authority of this document that he is willing to cooperate with any applicant on reasonable and non-discriminatory terms and conditions. Next, negotiations will be held regarding patent licensing. The patent holder's statement has been filed with the issuing agency of this document. The patent holders listed in Table 1 hold the patents covered in this document. Table

1. Information on patent holders of the patents covered in this document. Patent holder address Nanning Customs Technology Center, No.

20 Tiqiang Road, Liangqing District, Nanning City, Guangxi Zhuang Autonomous Region
Please note that in addition to the patents mentioned above, some content in this document may still involve patents. The issuing organization of this document assumes no responsibility for patent identification. responsibility. Aluminum, magnesium, potassium and barium in the pyrotechnic powder used in fireworks and firecrackers Content determination by inductively coupled plasma emission ICP-OES method

1 Scope

GB/T 47164-2026 is the Chinese national standard covering analysing a pyrotechnic composition - the metals that provide the light and the heat and the barium that colours it green and is toxic, quantified by ICP-OES to check the formulation against what is permitted. First edition, in force since 1 June 2026. It was issued on 27 February 2026 and has been in force since 1 June 2026, as a first edition. The document is under the responsibility of the China National Light Industry Council. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document describes a method for determining the content of aluminum, magnesium, potassium, and barium in pyrotechnic powder and raw materials used in fireworks and

firecrackers. This document applies to the determination of aluminum, magnesium, potassium, and barium content in pyrotechnic powder and raw materials used in fireworks and firecrackers.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 602 Preparation of standard solutions for the determination of impurities in chemical reagents

GB/T 6682 Specifications and test methods for water used in analytical laboratories

GB/T 41644 Test Methods for Fireworks and Firecrackers AQ4115 Technical Specification for Preventing Static Electricity Hazards in Fireworks and Firecrackers

3 Terms and Definitions

This document does not contain any terms or definitions that need to be defined.

4. Sample preparation Unless otherwise specified, the water used in this document refers to Class II water as defined in GB/T 6682.

4.1 Reagents and Materials

4.1.1 Hydrochloric acid. Superior grade.

4.1.2 Hydrochloric acid solution. Measure 10 mL of hydrochloric acid, add 190 mL of water, and mix well.

4.2 Equipment and Devices

4.2.1 Temperature-controlled oven. accuracy is $\pm 2.5^{\circ}\text{C}$.

4.2.2 Analytical balance. accuracy is

0.1 mg.

4.2.3 Copper test sieve. sieve aperture diameter is $250\mu\text{m}$.

4.2.4 Routine laboratory glassware. beakers, volumetric flasks, etc.

4.2.5 Dryer. with an inner diameter of $\phi(240\sim 260)\text{mm}$, using silica gel as the desiccant.