

HJ

INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

HJ 767-2015

**Solid waste. Determination of total barium. Graphite furnace
atomic absorption spectrophotometry**

固体废物 钡的测定 石墨炉原子吸收分光光度法

(English Translation)

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Foreword

In order to implement the Environmental Protection Law of the People's Republic of China and the Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Wastes, Protect the environment, protect human health, regulate the solid waste and solid waste leaching solution of barium determination method, the development of this standard.

This standard specifies the graphite furnace atomic absorption spectrophotometric method for the determination of barium in solid waste and solid waste leachate.

This standard is the first release.

Appendix A and Appendix B of this standard are informative.

This standard is organized by the Ministry of Environmental Protection Science and Technology Standards Division.

The main drafting unit of this standard. China Environmental Monitoring Station,

Guangdong Province Environmental Monitoring Center.

The standard verification unit. Sichuan Province Environmental Monitoring Station, Chongqing Environmental Monitoring Center, Liaoning Province, environmental monitoring experiment Xin, Henan Province Environmental Monitoring Center, Guangdong Province Environmental Monitoring Center, Guangzhou Environmental Monitoring Center Station, Nanchang Environmental Monitoring station.

The Environmental Protection Department of this standard approves on November 20, 2015.

This standard is implemented as of December 15, 2015.

This standard is explained by the Ministry of Environmental Protection.

Determination of barium in solid waste - Graphite furnace atomic absorption spectrophotometric method WARNING. The barium standard solution used in the experiment is toxic. Nitric acid, perchloric acid with strong oxidizing and corrosive, salt Acid, hydrofluoric acid with strong volatile and corrosive, the operation should wear protective equipment, solution preparation and sample pretreatment process should be in the fume hood operation.

1 Scope of application

This standard specifies the determination of barium in solid waste and solid waste leachate by graphite furnace atomic absorption spectrophotometry.

This standard applies to the determination of barium in solid waste and solid waste leachate.

When the amount of solid waste is 0.1 g, the limit of detection is 6.3 mg/kg and the lower limit is determined.

For 25.2 mg/kg. When the sample volume of solid waste leaching solution is 25 ml, the volume is set to 50 ml and the injection volume is 20 μ l.

The detection limit was 2.5 μ g/L and the lower limit was 10.0 μ g/L.

2 Normative reference documents

The contents of this standard refer to the following documents or their terms. Any unspecified date of the reference file, the effective version of the appropriate for this standard.

Technical specification for SJ sample preparation for industrial solid waste Technical Specification for Hazardous Waste Identification HJ/T 299 Solid waste leaching toxicity leaching method sulfuric acid nitric acid method HJ/T 300 solid waste leaching toxicity

leaching method acetic acid buffer solution method HJ 557 Solid waste leaching toxicity
leaching method Horizontal oscillation method

3 Principle of the method

Solid waste or solid waste leachate after digestion, into the graphite furnace atomizer, after drying, ashing and atomic and the barium-based atoms formed by the barium compound are absorbed by the 553.6 nm characteristic line, and the absorption intensity is within a certain range the mass concentration of barium in the test solution is proportional.

4 Interference and elimination

4.1

The total concentration of potassium, sodium and magnesium in the sample is 500 mg/L, the chromium is 10 mg/L, the manganese is 25 mg/L, the total concentration of iron and zinc 2.5 mg/L, 2 mg/L aluminum, and 5% nitric acid, there was no effect on the determination of barium. When the concentration of these substances is over when the mass concentration is used, the sample dilution method or the standard addition method can be used to eliminate the interference.

4.2

Calcium concentration in the sample is greater than 5 mg/L, the barium determination of positive interference. When injecting the concentration of calcium in the atomizer 100 mg/L ~ 300 mg/L, the interference of calcium to barium does not change with the change of calcium concentration. According to the interference characteristics of calcium, join the base Body modifier calcium nitrate, can eliminate the memory effect can improve the sensitivity of the determination. If the concentration of calcium in the sample exceeds 300 Mg/L, the sample should be properly diluted and determined.

4.3

When the sample matrix composition is complex or unknown, the sample dilution method or standard addition method should be used to examine whether the sample it is appropriate to use the calibration curve method to quantify directly. See Appendix A for the standard addition method curve. See Appendix B for the applicability of the standard addition method.

5 Reagents and materials

Unless otherwise stated, analytical reagents conforming to national standards are used in the analysis, and the test water is a newly prepared deionized water.

5.1

nitric acid (HNO₃). rho = 1.42 g/ml, excellent grade pure.

5.2

hydrochloric acid (HCl). rho = 1.19 g/ml, excellent grade pure.

5.3

hydrofluoric acid (HF). rho = 1.49 g/ml, excellent grade pure.

5.4

perchloric acid (HClO₄). rho = 1.68 g/ml, excellent grade pure.

5.5

barium nitrate [Ba (NO₃)₂]. pure spectrum.

5.6

calcium nitrate [Ca (NO₃)₂ · 4H₂O]. excellent grade pure.

5.7

argon. purity >=99.999%.

5.8

nitric acid solution. 1 1 (v/v), prepared with (5.1).

5.9

Nitric acid solution. 1 9 (v/v), prepared with (5.1).

5.10

nitric acid solution. 1 99 (v/v), prepared with (5.1).

5.11

hydrochloric acid solution. 1 1 (v/v), prepared with (5.2).

5.12

barium standard stock solution. rho (Ba) = 1 000 mg/L.

Use a commercially available standard solution or weigh 0.190 3 g barium nitrate (5.5) (accurate to 0.000 1 g), add 1 ml Nitric acid (5.1) dissolved, if necessary, can be heated. Into the 100 ml volumetric flask, with nitric acid solution (5.10) constant volume to the marking, Mix well.

5.13

barium standard intermediate liquid. rho (Ba) = 10.00 mg/L.

Accurate removal of barium standard stock solution (5.12) 10.00 ml in 1 000 ml volumetric