

HJ

INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

HJ 750-2015

**Solid Waste. Determination of total chromium. Furnace atomic
absorption spectrometry**

固体废物 总铬的测定 石墨炉原子吸收分光光度法

(English Translation)

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Table of Contents

Foreword

1 Scope of application

2 Normative reference documents

3 Principle of the method

4 Interference and elimination

5 Reagents and materials

5.8 Calcium nitrate solution. $\rho(\text{Ca}) = 2000 \text{ mg/L}$

5.12 Chromium standard stock solution. $\rho(\text{Cr}) = 1000 \text{ mg/L}$

5.13 Chromium standard intermediate solution. $\rho(\text{Cr}) = 10 \text{ mg/L}$

5.14 Chromium standard use of liquid. $\rho(\text{Cr}) = 0.5 \text{ mg/L}$

6 Instruments and equipment

7 Samples

7.1 Collection and storage of samples

7.2 Preparation of the sample

7.3 Preparation of samples

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 determination of total chromium in solid waste, the development of this standard.

This standard specifies the total chromium in solid waste by graphite furnace atomic absorption spectrophotometry.

This standard is the first release.

Appendix A to this standard is a normative appendix, Appendix B and Appendix C are informative appendices.

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

The main drafting unit of this standard. Harbin Environmental Monitoring Center Station.

The standard verification unit. Heilongjiang Province Environmental Monitoring Center

Station, Dalian Environmental Monitoring Center, Changchun Environmental Monitoring Heart station, Qiqihar City Environmental Monitoring Center Station, Daqing City Environmental Monitoring Center Station and Anshan City Environmental Monitoring Center Station.

The Environmental Protection Department of this standard approves on August 21, 2015.

This standard is implemented on October 1, 2015.

This standard is explained by the Ministry of Environmental Protection.

Determination of total chromium - Solid waste - Graphite furnace atomic absorption spectrophotometric method WARNING. Disassembly shall be carried out in a fume hood and shall be protected against contact with skin and clothing as required.

1 Scope of application

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

This standard is applicable to the determination of total chromium in solid waste and solid waste leachate.

Determination of solid waste, the sample volume of 0.2 g, constant volume of 50 ml and the injection volume of 20 μ l, the method detection limit 0.2 mg/kg, the determination of the lower limit of 0.8 mg/kg. Determination of solid waste leachate, volume of 50 ml and the amount of injection 20 μ l, the detection limit of this method is 0.7 μ g/L, the determination of the lower limit of 2.8 μ g/L.

2 Normative reference documents

The contents of this standard refer to the following documents or their terms. Any annotated file that does not specify the date, its valid version Applicable to this standard.

Solid waste leaching toxicity leaching method 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

The solid waste of the whole digestion or leaching solution into the graphite furnace atomizer, the chromium ions in the graphite tube through Atomization of the ground chromium atoms on the chromium hollow cathode lamp emission of 357.9 nm or 359.3nm characteristic line selective absorption, its absorbance in a certain range with the mass

concentration of chromium is proportional to.

4 Interference and elimination

4.1

Low concentrations of calcium or phosphate may cause interference to the assay, and when the concentration of calcium or the concentration of phosphate is greater than 200 mg/L, the effect of calcium remains constant and the effect of the phosphate is eliminated. Add calcium nitrate solution concentration greater than 2000 mg/L when the interference will be stable. Refer to Appendix C for the addition of the modifier.

4.2

The use of pyrolytic graphite tubes and coated graphite tubes can eliminate the effects of carbides.

5 Reagents and materials

5.1

Experimental water. secondary distilled water or pure water equipment prepared by the water. Before use to be blank test, to confirm no target or target concentration below the method detection limit.

5.2

Potassium Dichromate ($K_2Cr_2O_7$). Reference reagent.

5.3

Calcium nitrate [$Ca(NO_3)_2 \cdot 4H_2O$], excellent grade pure.

5.4

nitric acid (HNO_3). $\rho = 1.42$ g/ml, excellent grade pure.

5.5

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

5.6

Hydrogen peroxide (H_2O_2). $\rho = 1.11$ g/ml, excellent grade pure.

25.7 hydrofluoric acid (HF). $\rho = 1.18$ g/ml, excellent grade pure.

5.8 Calcium nitrate solution. $\rho(Ca) = 2000$ mg/L

11.8 g of calcium nitrate [$Ca(NO_3)_2 \cdot 4H_2O$] was weighed and dissolved in a nitric acid solution (5.9) and diluted to 1000 ml.

5.9 Nitric acid solution. 1:99 (V/V), prepared with nitric acid (5.4).

5.10 nitric acid solution. 1 1 (V/V), prepared with nitric acid (5.4).

5.11 hydrochloric acid solution. 1 2 (V/V), prepared with hydrochloric acid (5.5).

5.12 Chromium standard stock solution. $\rho(\text{Cr}) = 1000 \text{ mg/L}$

Purchase a commercially available standard material/certified standard sample, or accurately weigh 0.2829 g of reference potassium dichromate (5.2) A small amount of water dissolved, transferred to 100 ml volumetric flask, the experimental water volume after shake, keep at room temperature for 6 months.

5.13 Chromium standard intermediate solution. $\rho(\text{Cr}) = 10 \text{ mg/L}$

Accurate amount of chromium standard stock solution (5.12) 1.0 ml in 100 ml volumetric flask, the experimental water volume shake.

5.14 Chromium standard use of liquid. $\rho(\text{Cr}) = 0.5 \text{ mg/L}$

Accurate amount of chromium standard intermediate solution (5.13) 5.0 ml in 100 ml volumetric flask, the experimental water volume shake.

5.15 argon. purity $\geq 99.99\%$.

6 Instruments and equipment

6.1

Graphite Furnace Atomic Absorption Spectrophotometer with Chrome Hollow Cathode Lamp.

6.2

graphite tube, coated graphite tube.

6.3

Filtration device. 0.45 μm pore size acetate or polyethylene filter.

6.4

Electric plate. with temperature control function.

6.5

microwave digestion instrument. a temperature control and program temperature function, the temperature accuracy of up to $\pm 2 \text{ }^{\circ}\text{C}$.

6.6

balance. accuracy of 0.0001 g.