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

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**Water quality. Determination of barium. Graphite furnace atomic
absorption spectrophotometry
(English Translation)**

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Foreword

To protect the environment and protect the human body 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 Water Pollution Prevention and Control this standard is established for the determination of the health and standardization of strontium in water.

This standard specifies the graphite furnace atomic absorption spectrophotometry for the determination of bismuth in water.

This standard is the first release.

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

This standard was formulated by the Science and Technology Standards Department of the Ministry of Environmental Protection.

This standard is mainly drafted by. Changchun Environmental Monitoring Center Station.

This standard is verified by. Shenyang Environmental Monitoring Center Station, Dalian Environmental Monitoring Center, Jilin Province Environmental Monitoring Center Station, Harbin Municipal Environmental Monitoring Center Station, Technical Center of Jilin Entry-Exit Inspection and Quarantine Bureau and Jilin Province Product Quality Supervision and Inspection Institute.

This standard was approved by the Ministry of Environmental Protection on February 10, 2011.

This standard has been implemented since June 1, 2011.

This standard is explained by the Ministry of Environmental Protection.

Water quality Determination of graphite furnace atomic absorption spectrophotometry

1 Scope of application

This standard specifies the graphite furnace atomic absorption spectrophotometry for the determination of bismuth in water.

This standard applies to the determination of soluble strontium and total strontium in surface water, groundwater, industrial wastewater and domestic sewage.

When the injection volume is 20.0 μL , the detection limit of this method is 2.5 $\mu\text{g/L}$, and the lower limit of determination is 10.0 $\mu\text{g/L}$.

2 Normative references

The contents of this standard refer to the following documents or their terms. For undated references, the valid version applies to this standard.

quasi.

HJ/T 91 Surface Water and Wastewater Monitoring Technical Specifications HJ/T 164
Technical Specifications for Groundwater Environmental Monitoring

3 Terms and definitions

The following terms and definitions apply to this standard.

Soluble ?soluble barium Refers to the enthalpy determined after filtration of a non-acidified sample through a 0.45 µm filter.

Total quantity of barium Refers to the enthalpy determined after digestion of the unfiltered sample.

4 Principle of the method

The sample is filtered or digested and injected into a graphite furnace atomizer. The helium ions are atomized in the graphite tube by high temperature, and the ground state atoms are hollowed out.

The characteristic line emitted by the cathodic lamp emits selective absorption at 553.6 nm, and its absorbance value is proportional to the mass concentration of erbium.

5 Interference and elimination

5.1

The concentration of potassium, sodium and magnesium in the sample is 500 mg/L, chromium is 10 mg/L, manganese is 25 mg/L, iron and zinc are 2.5 mg/L, aluminum when it is 2 mg/L and the nitric acid is 5% (volume fraction) or less, there is no influence on the measurement of hydrazine. When the mass concentration of these substances exceeds the above quality at the concentration, the standard addition method can be used to eliminate the interference, see Appendix A. The applicability of the standard addition method is judged in Appendix B.

5.2

When the mass concentration of calcium in the sample is greater than 5 mg/L, it will cause positive interference to the determination of strontium. When the mass concentration of calcium in the atomizer is when 100~300 mg/L, the interference of calcium on strontium does not change with the change of calcium concentration. According to the interference characteristics of calcium, the chemical improver nitric acid is added.

Calcium solution (6.9) can both eliminate the memory effect and increase the sensitivity of the assay. If the mass concentration of calcium in the sample exceeds 300 mg/L, it should be the sample was appropriately diluted and measured.

6 Reagents and materials

Analytically pure reagents in accordance with national standards were used for analysis, unless otherwise stated. The experimental water was deionized water or water of equivalent purity.

6.1

Concentrated nitric acid. $\rho(\text{HNO}_3) = 1.42 \text{ g/ml}$, excellent grade pure.

6.2

Nitric acid solution. 0.5% (volume fraction), prepared with concentrated nitric acid (6.1).

6.3

Concentrated nitric acid. $\rho(\text{HNO}_3) = 1.42 \text{ g/ml}$.

6.4

Nitric acid solution. 19. Prepared with concentrated nitric acid (6.3).

6.5

Barium nitrate $[\text{Ba}(\text{NO}_3)_2]$. Spectral purity.

6.6

standard stock solution. $\rho(\text{Ba}) = 1\,000 \text{ mg/L}$.

Accurately weigh 0.1903 g lanthanum nitrate (6.5), dissolve it with nitric acid solution (6.2) and dilute to 100 ml, mix. Or buy a city Standard materials are sold.

6.7

standard intermediate solution. $\rho(\text{Ba}) = 50.0 \text{ mg/L}$.

Accurately measure 5.00 ml of standard stock solution (6.6) in a 100 ml volumetric flask, dilute to the mark with nitric acid solution (6.2), and mix.

Stored in a polyethylene bottle and stored for 30 days at 4 °C.

6.8

Standard use solution. $\rho(\text{Ba}) = 1.0 \text{ mg/L}$.

Accurately measure 2.00 ml of standard intermediate solution (6.7) in a 100 ml volumetric flask and dilute to the mark with nitric acid solution (6.2).

Mix well.

6.9

Calcium nitrate solution. $\rho(\text{Ca}) = 500 \text{ mg/L}$.

Accurately weigh 2.95 g of calcium nitrate $[\text{Ca}(\text{NO}_3)_2 \cdot 4\text{H}_2\text{O}]$, dissolve it with nitric acid