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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 1617-2023

Replacing GB/T 1617-2014

Barium chloride for industrial use

工业氯化钡

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Standardization Administration of China

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1 Scope

GB/T 1617-2023 is the Chinese national standard on barium chloride for industrial use, in the field of chemical technology. 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 7 September 2023 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 April 2024. Classification: ICS 71.060.50, CCS G12. 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 classification, requirements, test methods, inspection rules, marking, labels and accompanying documents, as well as packaging, transportation and storage of barium chloride for industrial use. This document applies to barium chloride for industrial use.

Note. This product is mainly used in industries such as metal heat treatment, barium salt manufacturing, pesticides, dehydrating agents, electronics, instruments, metallurgy,

papermaking, pigments, rubber, plastics, ceramics, oil refining, petrochemicals, etc., as well as for removing sulfate ions and other substances from desalinated water in the chlor-alkali industry.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB 190, Packing symbol of dangerous goods

GB/T 191-2008, Packaging - Pictorial marking for handling of goods

GB/T 3049-2006, Chemical products for industrial use - General method for determination of iron content - 1,10-Phenanthroline spectrophotometric method

GB/T 6678, General principles for sampling chemical products

GB/T 6682-2008, Water for analytical laboratory use - Specification and test methods

GB/T 8170, Rules of rounding off for numerical values & expression and judgment of limiting values

GB 15258, General rules for preparation of precautionary label for chemicals

HG/T 3696.1, Inorganic chemicals for industrial use - Preparations of standard and reagent solutions for chemical analysis - Part

3 Terms and definitions

No terms and definitions need to be defined in this document.

4 Molecular formula and relative molecular mass

Molecular formula. $BaCl_2 \cdot 2H_2O$. Relative molecular mass. 244.26 (according to the international relative atomic mass in 2022);

5 Classification

Barium chloride for industrial use is classified into two types according to its use. -- Type I is high-purity barium chloride; -- Type II is ordinary barium chloride.

6 Requirements

6.1 Appearance. White flaky or powdery crystals.

6.2 The chemical composition content and grades of barium chloride for industrial use shall

comply with the provisions of Table 1. Table 1

7 Test methods

7.1 General provisions The reagents and water used in this document, unless otherwise specified with other requirements, refer to analytical reagents and Grade 3 water specified in Table 1 of GB/T 6682-2008.The standard titration solutions, impurity standard solutions, preparations and products for tests, unless otherwise specified with other requirements, shall be prepared according to the provisions of HG/T 3696.1, HG/T 3696.2 and HG/T 3696.3.

7.2 Appearance inspection The appearance shall be inspected by visual method under natural light on a watch glass with a white background or a white porcelain plate.

7.3.1 Barium chromate gravimetric method (arbitration method)

7.3.1.1 Principle Use ammonium acetate to adjust the pH of the solution. In ammonium acetate solution and ammonia solution, potassium dichromate and barium chloride uniformly generate barium chromate precipitate. Calculate the content of barium chloride according to the mass of barium chromate precipitate.

7.3.1.2 Reagents or materials 7.3.1.2.1 Hydrochloric acid solution. 1+11. 7.3.1.2.2 Potassium dichromate solution. 50 g/L. 7.3.1.2.3 Ammonium acetate solution. 75 g/L. 7.3.1.2.4 Ammonia solution. 1+27. 7.3.1.2.5 Silver nitrate solution. 17 g/L.

7.3.1.3 Instruments and apparatuses 7.3.1.3.1 Glass sand crucible. Filter plate pore size 5 μm ~ 15 μm. 7.3.1.3.2 Electrically heated constant-temperature drying oven. Temperature controlled at 133 °C±2 °C.

7.3.1.4 Test procedure Weigh approximately 7 g of the sample, accurate to 0.000 2 g; place it in a beaker; add water to dissolve; transfer into a 500 mL volumetric flask; use water to dilute to the mark; shake well; dry filter; discard the first 25 mL of filtrate. Pipette 50 mL of the filtrate into a 400 mL beaker. Add 5 mL of hydrochloric acid solution; add 100 mL of water and 15 mL of potassium dichromate solution; heat to boiling. Under the condition of slight boiling, while stirring, slowly add 10 mL of ammonium acetate solution dropwise (complete the addition within 3 min ~ 4 min); keep warm for 5 min; continue to add 15 mL of ammonia solution dropwise while stirring under slight boiling condition (complete the addition within 2 min ~ 3 min). Allow to stand for 30 min in a water bath at about 80 °C, then take out and rapidly cool to room temperature. Use a glass sand crucible that has been dried at 133 °C±2 °C to constant mass for suction filtration; use distilled water containing a small amount of ammonia solution (pH 7 ~ 8) to wash the precipitate until no chloride ion reaction occurs (checked with silver nitrate solution); dry the glass sand crucible and precipitate at 133 °C±2 °C to constant mass.

7.3.1.5 Test data processing The content of barium chloride is expressed as the mass

fraction w1 of barium chloride (BaCl2·2H2O), and is calculated according to Formula (1). Where. m1 - the mass value of barium chromate and glass sand crucible after drying, in grams (g); m2 - the mass value of the glass sand crucible, in grams (g); m - the mass value of the test sample, in grams (g); 0.964 2 - the conversion factor of barium chromate (BaCrO4) to barium chloride (BaCl2·2H2O). Take the arithmetic mean of two parallel determination results as the determination result. The absolute difference between the two parallel determination results shall not be greater than 0.2%.

7.3.2 Barium sulfate gravimetric method

7.3.2.1 Principle Under acidic conditions, the test sample solution reacts with sulfuric acid, causing Ba^2+ to be completely converted into barium sulfate. Calculate the content of barium chloride according to the mass of barium sulfate.

7.3.2.2 Reagents or materials 7.3.2.2.1 Hydrochloric acid solution. 1+1. 7.3.2.2.2 Sulfuric acid solution. 1+15. 7.3.2.2.3 Silver nitrate solution. 17 g/L.

7.3.2.3 Instruments and apparatuses 7.3.2.3.1 High-temperature furnace. The temperature can be controlled at 800 °C±20 °C. 7.3.2.3.2 Electrically heated constant-temperature water bath. The temperature can be controlled at 78 °C ~ 82 °C.

7.3.2.4 Test procedure Weigh

0.6 g of the test sample, accurate to 0.000 2 g; place it into a 300 mL beaker; add 30 mL of water and 2 mL of hydrochloric acid solution; heat the solution to boiling; use slow-speed quantitative filter paper for filtration; use hot water to wash the residue until no chloride ions are present (checked with silver nitrate solution). Collect the filtrate and washing liquid into a 500 mL beaker; add water until the solution volume is approximately 300 mL. Under stirring, add 10 mL of hot sulfuric acid solution at a uniform rate; cover with a watch glass. Transfer to a constant-temperature water bath at approximately 80 °C and keep warm for 1 h. Then use slow-speed quantitative filter paper for filtration; use hot water to wash the precipitate until the filtrate has no chloride ions (checked with silver nitrate solution). Place the precipitate together with the filter paper into a porcelain crucible which has been previously ignited at 800 °C±20 °C to constant mass; dry and ash at low temperature on an electric furnace; then place in a high-temperature furnace at 800 °C±20 °C and ignite to constant mass.

7.3.2.5 Test data processing The content of barium chloride is expressed as the mass fraction w1 of barium chloride (BaCl2·2H2O), and is calculated according to Formula (2). Where. m3 - the mass value of the precipitate and porcelain crucible, in grams (g); m4 - the mass value of the porcelain crucible, in grams (g); m - the mass of the sample, in grams (g); w2 - the mass fraction of strontium in the test sample determined according to

7.4 or 7.10; 1.047 - the conversion factor of barium sulfate (BaSO4) to barium chloride