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

GB/T 13748.18-2026

Replacing GB/T 13748.18-2005

**Methods for chemical analysis of magnesium and magnesium
alloys - Part 18: Determination of chlorine content - Silver
chloride turbidimetric method**

镁及镁合金化学分析方法 第18部分：氯含量的测定 氯化银浊度法

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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 is Part 18 of GB/T 13748, "Chemical Analysis Methods for Magnesium and Magnesium Alloys". GB/T 13748 has published the following... part.

1. Determination of Aluminum Content;
2. Determination of Tin, Beryllium, Copper, Nickel and Titanium Content by Spectrophotometry;
3. Determination of Lithium and Silver Content by Flame Atomic Absorption Spectrometry;
4. Determination of Manganese and Zirconium Content by Spectrophotometry;
8. Determination of Rare Earth Content;
9. Determination of Iron and Silicon Content by Spectrophotometry;
13. Determination of Lead, Calcium, Potassium and Sodium Content by Flame Atomic Absorption Spectrometry;
15. Determination of Zinc Content;
18. Determination of Chlorine Content using the Silver Chloride Turbidity Method;
20. Determination of Elemental Content by Inductively Coupled Plasma Atomic Emission Spectrometry;
21. Determination of Elemental Content by Direct-Reading Atomic Emission Spectrometry;
22. Determination of Thorium Content;

5.6 Chlorine Standard Solution (50 µg/mL). Transfer

25.00 mL of chlorine standard stock solution (5.5) to a 500 mL volumetric flask and dilute with water to the specified concentration. Graduate the scale and mix well. 1 mL of this solution contains 50 µg of chlorine.

6. Instruments Spectrophotometer.

The sample was processed into fragments with a thickness of no more than 1 mm.

8 Test Procedure

8.1 Samples Weigh the sample according to Table 1 (Chapter 7), accurate to 0.0001g, and record it as m0.

8.2 Parallel Tests Perform the experiment twice in parallel and take the average value.

8.3 Blank Test A blank test was performed along with the sample.

8.4 Measurement

8.4.1 Place the sample in a 300mL beaker, and slowly add the corresponding sulfuric acid (5.3) according to Table

1. After the sample has completely dissolved, transfer it to a container. If the 100mL volumetric flask is cloudy and requires filtration, consider the chlorine contamination introduced by the filter paper. It can be rinsed first with sulfuric acid (5.3) and water until no chlorine ions remain. [Substance], cool to room temperature.

8.4.2 Add 3 mL of nitric acid (5.1) and mix well. Add 2 mL of acetone (5.2) and mix well. Add 2 mL of silver nitrate solution (5.4) and dilute with water. Dilute to the mark and mix well. Place the volumetric flask in a water bath at 70°C~80°C and heat for 10 minutes. Remove and cool to room temperature under running water. Transfer to a dark room. Let it sit for 10 minutes.

8.4.3 Transfer a portion of the test solution into a 3cm cuvette, using water as a reference, and measure its absorbance at a wavelength of 420nm using a spectrophotometer. Subtract... The mass of chlorine (m1) can be obtained from the working curve by using the absorbance of the blank solution along with the sample.

8.5 Plotting the Working Curve

0.50 mL,

4.00 mL to a set of 100 mL volumetric flasks respectively.

5.00 mL of chlorine standard solution (5.6), proceed as per 8.4.2.

8.5.2 Transfer a portion of the test solution into a 3cm cuvette, using the "zero" concentration solution in the working curve series of standard solutions as a reference, and perform spectrophotometry. The absorbance of a series of standard solutions was measured at a wavelength of 420 nm. A working curve was plotted with the mass of chlorine on the x-axis and absorbance on the y-axis. The linear correlation coefficient of the working curve should not be less than 0.999.

10 Precision

10.1 Repeatability The measured values of two independent test results obtained under repeatability conditions, within the range of the average values given in Table 2, represent the two test results. The absolute difference does not exceed the repeatability limit (r), and the number of cases exceeding the repeatability limit (r) does not exceed 5%. The repeatability limit (r) is determined by linearity based on the data in Table 2. Obtained by interpolation or extrapolation.

10.2 Reproducibility The measured values of two independent test results obtained under reproducibility conditions, within the range of the average values given in Table 3, represent the two test results. The absolute difference should not exceed the reproducibility limit (R), and the number of cases exceeding the reproducibility limit (R) should not exceed 5%. The reproducibility limit (R) is calculated using linear regression based on the data in Table 3. It can be obtained by interpolation or extension.

11 Test Report The test report should include at least the following.

- Test subjects;
- Document number;
- Analysis results and their representation;
- Differences from basic analytical procedures;
- Observed anomalies;

18 Determination of Chlorine Content Silver chloride turbidimetric method

1.Scope This document describes a method for determining the chlorine content in magnesium and magnesium alloys using the silver chloride turbidity method. This document applies to the determination of chlorine content in magnesium and magnesium alloys. Determination range (mass fraction). 0.0010%~0.10%.

3.Terms and Definitions This document does not contain any terms or definitions that need to be defined.

4.Method Overview The sample was dissolved in sulfuric acid. In the presence of acetone,

chlorine reacted with silver nitrate to form a silver chloride emulsion. The solution was measured at a spectrophotometer at a wavelength of 420 nm. Measure its absorbance, find the mass of chlorine according to the working curve, and calculate the mass fraction of chlorine.

5.Reagents or materials Unless otherwise specified, only reagents confirmed to be of analytical grade and grade II water conforming to GB/T 6682 shall be used in the analysis.

5.1 Nitric acid ($\rho=1.42\text{g/mL}$).

5.3 Sulfuric acid (1 3).

5.4 Silver nitrate solution (10 g/L). Store in a brown glass bottle away from light.

5.5 Chlorine Standard Stock Solution (1 mg/mL). Weigh 1.6485 g of sodium chloride (pre-calculated at $400^{\circ}\text{C}\sim 500^{\circ}\text{C}$ to constant weight, without explosion). The crackling sound (after cooling to room temperature in a desiccator) is dissolved in water, transferred to a 1000 mL volumetric flask, diluted to the mark with water, and mixed well. This solution... 1 mL contains 1 mg of chlorine.