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

GB/T 12689.7-2010

Replacing GB/T 12689.7-2004

**Methods for chemical analysis of zinc and zinc alloys -- Part 7:
Determination of magnesium content -- Flame atomic
absorption spectrometric method**

锌及锌合金化学分析方法 第7部分:镁量的测定 火焰原子吸收光谱法

(English Translation)

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Foreword

GB/T 12689-2010 "Methods for chemical analysis of zinc and zinc alloy" is divided into 13 parts.

--- Part 1. Determination of the amount of chrome aluminum azure S- octyl polyethylene glycol phenyl ether - cetylpyridinium bromide, spectrophotometry, CAS Spectrophotometry and EDTA titration;

--- Part 2. Determination of arsenic content by atomic fluorescence spectrometry;

--- Part 3. Determination of cadmium content by flame atomic absorption spectrometry;

--- Part 4. Determination of the amount of copper diethyl dithiocarbamate lead spectrophotometry, flame atomic absorption spectrometry and electric solution;

--- Part 5. Determination of iron content sulfosalicylic acid spectrophotometric method and the flame atomic absorption spectrometry;

--- Part 6. Determination of lead content oscillopolarographic law;

--- Part 7. Determination of magnesium content - Flame atomic absorption spectrometry;

--- Part 8. Determination of silicon content - Molybdenum blue spectrophotometric method;

--- Part 9. Determination of antimony content atomic fluorescence spectrometry and flame atomic absorption spectrometry;

--- Part 10. Determination of tin content Phenylfluorone - cetyl trimethylamine spectrophotometry;

--- Part 11. lanthanum, cerium contents measured Tribromoarsenazo spectrophotometry;

--- Part 12. lead, cadmium, iron, copper, tin, aluminum, arsenic, antimony, magnesium, lanthanum, cerium content - Inductively coupled plasma optical emission Spectroscopy;

--- Part 13. Optical Emission Spectrometry.

This is Part 7.

This section drafted in accordance with GB/T 1.1-2009 given rules.

The partial modification of the use of ISO 3750:2006 (E) "Zinc Alloy Flame atomic absorption spectrometry magnesium content" (in English).

The section on the main technical content of ISO 3750:2006 (E) the same as the preparation of the corresponding structure is not completely listed in Appendix A of this Part reg number and ISO 3750:2006 Control List (E) reg numbers, are listed in Appendix B of this section and ISO 3750:2006 (E) List of technical differences and their causes. About the technical differences have been incorporated into the text in which they are involved Terms of the margin identified by a single vertical line.

This Part replaces GB/T 12689.7-2004 "zinc and zinc alloys - Determination of magnesium content - Flame atomic absorption spectrometric law". This section compared with the original standards, the main changes are as follows.

- Lower limit of the measurement range from 0.010% to 0.0020% next extension;
- Increasing the test report clause;
- Increased in Appendices A and B.

The non-ferrous metal part by the National Standardization Technical Committee (SAC/TC243) centralized.

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1 Scope

This section specifies the determination method of zinc and zinc alloy magnesium content.

This section applies to the determination of zinc and zinc alloy magnesium content.
Measurement range. 0.0020% to 0.20%.

2 Principle of the method

Samples with hydrochloric acid - nitric acid mixture dissolved in dilute hydrochloric acid medium, in order to suppress interference lanthanum salts of aluminum, with an air - acetylene flame atomic absorption Close spectrometer at a wavelength of 285.2nm,

absorbance was measured magnesium.

3 Reagents

Unless otherwise indicated in the analysis using only recognized as analytical reagent and secondary water.

3.1

hydrochloric acid ($\rho=1.19\text{g/mL}$), pure class distinctions.

3.2

nitrate ($\rho=1.42\text{g/mL}$), pure class distinctions.

3.3

hydrochloric acid - nitric acid mixture. A 180mL of hydrochloric acid (3.1) and 4mL nitric acid (3.2) and mixed.

3.4

lanthanum solution (50g/L). Weigh 29.5g of lanthanum oxide, placed in 400mL beaker, was added 25mL of hydrochloric acid (3.1), after dissolved by heating Full cooled to room temperature and transferred to 500mL volumetric flask, dilute with water to volume, and mix.

3.5

zinc substrate solution (10g/L). Weigh 10g zinc metal ($w_{\text{Zn}}\geq 99.99\%$ and $w_{\text{Mg}}\leq 0.0002\%$), placed in 400mL beaker Added 100mL of water, 60mL of hydrochloric acid - nitric acid mixture (3.3), completely dissolved by heating, cooled to room temperature and transferred to 1000mL volumetric flask the diluted with water to volume, and mix.

3.6

aluminum precursor solution (1g/L). Weigh 1.00g of aluminum ($w_{\text{Al}}\geq 99.99\%$ and $w_{\text{Mg}}\leq 0.0002\%$), placed in 400mL beakers Adding a small amount of hydrochloric acid (3.1), completely dissolved by heating, cooled to room temperature and transferred to 1000mL volumetric flask, dilute with water to volume, and mix.

3.7

Magnesium standard stock solution. Accurately weigh 1.0000g of magnesium ($w_{\text{Mg}}\geq 99.99\%$), placed in 400mL beaker, add 20mL Water, 5mL hydrochloric acid (3.1), completely dissolved by heating, cooled to room temperature and transferred to 1000mL volumetric flask, dilute with water to volume, and mix. this 1mL 1mg solution containing magnesium.

3.8

Magnesium Standard solution. Pipette 10.00mL standard stock solution of magnesium (3.7), placed in 1000mL volumetric flask, was added 5mL hydrochloride (3.1), diluted with water to volume, and mix. This solution 1mL containing 10 μ g magnesium.

4 Instrument

Atomic absorption spectrometer, with a magnesium hollow cathode lamp.

Under optimum working conditions for those who can reach the following indicators can be used.

--- Characteristic concentration. a solution in the measurement matrix consistent solution features magnesium concentration should be less than 0.005 μ g/mL;

--- Precision. standard solution with the highest concentration of 10 times the absorbance measurements, the standard deviation should not exceed the average absorbance of 1.0%;