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

GB 3653.1-1983

**Ferroboron - Determination of boron content - Alkalimetry
method
(English Translation)**

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Table of Contents

Foreword
Introduction
1 Scope
2 Normative references
3 Terms and definitions
4 Principle
5 Reagents and Materials

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting:

This document is Part 1 of GB/T 3653: GB/T 3653 has been published in the following parts:

- Determination of boron iron boron content by alkaline titration method;
- Chemical analysis method of ferroboron Gas volumetric method for determination of carbon content;
- Determination of boron iron silicon content - Perchloric acid dehydration gravimetric method;
- Determination of boron, iron and aluminum content by EDTA titration method;
- Methods for chemical analysis of ferroboron: determination of sulfur content by chromatographic separation and barium sulfate gravimetric method;
- Chemical analysis method for ferroboron: the antimony-phosphorus-molybdenum blue photometric method for the determination of phosphorus content;
- Determination of boron iron and sulfur content by infrared absorption method:

This document replaces GB/T 3653.1-1988 "Chemical analysis method of ferroboron - Alkali titration method for determination of boron content" and is consistent with GB/T 3653.1-Compared with 1988, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

- a) Anhydrous sodium carbonate has been added (see 5.1);

- b) The sodium hydroxide is prepared in boiled water (see 5.11:1, 3:10:1 of the 1988 edition);
- c) Added analytical balance (see 6.2);
- d) Increased the number of measurements (see 8.2);
- e) Added the presentation of results (see 9.2);
- f) Repeatability limit and reproducibility limit are used instead of allowable error (see Chapter 10, Chapter 8 of the 1988 edition);
- g) Added the content of test report (see Chapter 11):

Introduction

Since there are many detection elements involved in the ferroboron detection process, the applicable scope and application methods of the elements are different:

The convenience and accuracy of iron detection standards, we have established a national standard system to support the detection of ferroboron for the analysis methods of different elements of ferroboron:

GB/T 3653 series of ferroboron analysis methods is the basic standard for ferroboron detection in my country, and is intended to consist of the following 7 parts:

--- Part 1: Determination of boron content in ferroboron by alkali titration:

Establish the law:

--- Part 2: Chemical analysis of ferroboron - Determination of carbon content by gas volumetric method: The purpose is to measure the carbon content in ferroboron using gas volumetric method:

Volumetric method:

--- Part 3: Determination of silicon content in ferroboron - Perchloric acid dehydration gravimetric method: The purpose is to measure the silicon content in ferroboron using a high Chlorate dehydration gravimetric method:

--- Part 4: Determination of aluminum content in ferroboron - EDTA titration method: The purpose is to measure the aluminum content in ferroboron using EDTA titration method:

--- Part 5: Chemical analysis of ferroboron - Determination of sulfur content by chromatographic separation and barium sulfate gravimetric method: The purpose is to measure the sulfur content of ferroboron:

The content was determined by the barium sulfate gravimetric method using chromatography:

--- Part 6: Chemical analysis method for ferroboron - Determination of phosphorus content by antimony phosphomolybdenum blue photometric method: The purpose is to measure the phosphorus content in ferroboron:

Using antimony phosphomolybdenum blue photometry:

--- Part 7: Determination of sulfur content in ferroboron - Infrared absorption method: The purpose is to measure the sulfur content in ferroboron using infrared Absorption method:

Determination of boron-iron-boron content-Alkali titration method Warning---People who use this document should have formal laboratory work experience: This document does not address all possible safety issues:

The user is responsible for taking appropriate safety and health measures and ensuring that the conditions stipulated by relevant national laws and regulations are met:

1 Scope

This document specifies the method for the determination of boron content in ferroboron by alkaline titration:

This document is applicable to the determination of boron content in ferroboron:

Determination range (mass fraction): 3.00%~26.00%:

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document:

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document:

GB/T 4010 Sampling and preparation of samples for chemical analysis of ferroalloys GB/T 6379.1 Accuracy (trueness and precision) of measurement methods and results Part 1: General principles and definitions GB/T 6379.2 Accuracy (trueness and precision) of measurement methods and results Part 2: Determination of repeatability of standard measurement methods Basic methods of sex and reproducibility GB/T 6682 Specifications and test methods for water used in analytical laboratories GB/T 8170 Rules for rounding off values and expression and determination of limit values GB/T 12806 Laboratory glassware single-line volumetric flasks GB/T 12808 Laboratory glassware single-line pipettes

3 Terms and definitions

There are no terms or definitions that require definition in this document:

4 Principle

The sample is melted and decomposed with anhydrous sodium carbonate or sodium potassium carbonate-sodium peroxide, then leached with water and dry filtered to separate iron, manganese, nickel, etc:

Use the pH meter to adjust the test solution to pH 6:9, add mannitol, and titrate with sodium hydroxide standard solution to pH 6:9 is the end point:

5 Reagents and Materials

Unless otherwise specified, only approved analytical grade or higher reagents and secondary or higher distillation reagents that comply with GB/T 6682 were used in the analysis:

Water or water of equivalent purity:

5.1

Sodium carbonate, anhydrous, solid:

5.2

Sodium potassium carbonate, solid: