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

GB/T 4699.2-2025

Replacing GB/T 4699.2-2008

**Ferrochromium, silicochromium, nitrogen-bearing ferrochromium and high
nitrogen ferrochromium - Determination of chromium content - Ammonium
persulfate oxidation titrimetric method and potentiometric titration method**

(English Translation)

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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 2 of GB/T 4699. GB/T 4699 has been published in the following parts.

---Determination of chromium content in ferrochrome, silicon-chromium alloy, ferrochrome nitride and high-nitrogen ferrochrome - ammonium persulfate oxidation titration and potentiometric titration (GB/T 4699.2);

--- Determination of phosphorus content in ferrochrome, silicon-chromium alloy and ferrochrome nitride - Bismuth phosphomolybdenum blue spectrophotometric method and molybdenum blue spectrophotometric method (GB/T 4699.3);

--- Ferrochromium and silicon-chromium alloys-Determination of carbon content-Infrared absorption method and gravimetric method (GB/T 4699.4);

--- Determination of sulfur content of ferrochrome and silicon-chromium alloys-Infrared absorption method and combustion neutralization titration method (GB/T 4699.6);

---Determination of silicon content in ferrochrome, silicon-chromium alloy, ferrochrome nitride and high nitrogen ferrochrome - Silicate molybdenum blue spectrophotometry, potassium fluorosilicate titration and perchloric acid dehydration gravimetric method (GB/T 4699.8).

This document replaces GB/T 4699.2-2008 "Determination of chromium content of ferrochrome and silicon-chromium alloys - Ammonium persulfate oxidation titration and potentiometric method" Compared with GB/T 4699.2-2008, in addition to structural

adjustments and editorial changes, the main technical changes are as follows.

a) The scope of application has been changed to include the determination of chromium content in nitrided ferrochrome and high nitrogen ferrochrome (see Chapter 1, 2008 edition).

Chapter 1);

b) The calibration method of ammonium ferrous sulfate standard titration solution in Method 1 has been changed from potassium permanganate standard titration solution to Calibrate with potassium dichromate standard titrant [see 4.2.15b), 3.2.17 of the 2008 edition];

c) The calibration method of potassium permanganate standard titration solution in Method 1 has been changed from standard sodium oxalate to ferrous ammonium sulfate.

Standardization with standard titrant solution [see 4.2.16b), 3.2.16 of the 2008 edition];

d) The sampling and preparation content in Method 1 has been changed to include the sampling and preparation requirements for nitride ferrochrome and high nitrogen ferrochrome samples (see 4.4, 2008 Version 3.4);

e) The sample weight in Method 1 has been changed from 0.50 g to 0.20 g (see 4.5.1, 2008 Edition).

3.5.1);

f) The preparation of the sample solution in Method 1 has been modified, and the steps of dilution, volume determination and aliquoting of the sample solution have been cancelled (see 4.5.3.1, 2008 3.5.2.1 of the 2016 edition);

g) The decomposition method of acid-soluble samples in Method 1 has been changed (see 4.5.3.1.1, 3.5.2.1.1 of the 2008 edition);

h) The vessel used for acid dissolution of silicon-chromium alloy in Method 1 has been changed (see 4.5.3.1.2, 3.5.2.1.2 of the 2008 edition);

i) The flux amount used in the alkali fusion method in Method 1 has been changed (see 4.5.3.1.3, 3.5.2.1.3 of the 2008 edition);

j) The allowable difference content in Method 1 has been changed (see 4.7, 3.7 of the 2008 edition);

k) The sampling and preparation content in Method 2 has been changed to include the sampling and preparation requirements for nitride ferrochrome and high nitrogen ferrochrome samples (see 5.4, 2008 Version 4.4);

l) The allowable difference in Method 2 has been modified (see 5.7, 4.7 of the 2008 edition);

m) Added the normative appendix "Flowchart of the test analysis result acceptance procedure" (see Appendix C).

This document is modified to adopt ISO 4140:1979 "Ferrochromium and silicon-chromium alloys-Determination of chromium content-Potentiometric method".

Compared with ISO 4140:1979, this document has many structural adjustments. The list of structural number changes between the two documents is attached.

Record A.

This document has many technical differences compared with ISO 4140:1979.

A list of these technical differences and their causes is given in Appendix B.

The following editorial changes have been made to this document.

--- Change the name of the standard to "Determination of chromium content in ferrochrome, silicon-chromium alloy, ferrochrome nitride and high nitrogen ferrochrome - Ammonium persulfate oxidation titration Method and Potentiometric Titration".

Introduction

Since there are many test elements involved in the detection process of ferrochrome, silicon-chromium alloy, ferrochrome nitride and high nitrogen ferrochrome, the applicable scope of the elements and in order to ensure the convenience and accuracy of the testing standards for ferrochrome, silicon-chromium alloy, ferrochrome nitride and high nitrogen ferrochrome, we the analysis methods for different elements in ferrochrome, silicon-chromium alloy, ferrochrome nitride and high-nitrogen ferrochrome have established a national standard system to support their detection.

GB/T 4699 series of analysis methods for ferrochrome, silicon-chromium alloy, ferrochrome nitride and high nitrogen ferrochrome is the standard for the analysis of ferrochrome, silicon-chromium alloy, ferrochrome nitride and high nitrogen ferrochrome in my country.

The basic standard for nitrogen chromium iron detection consists of the following parts.

---Determination of chromium content in ferrochrome, silicon-chromium alloy, ferrochrome nitride and high-nitrogen ferrochrome - ammonium persulfate oxidation titration and potentiometric titration (GB/T 4699.2). The purpose is to measure the chromium content in ferrochrome, silicon-chromium alloy, ferrochrome nitride and high nitrogen ferrochrome.

Ammonium acid oxidation titration and potentiometric titration.

--- Determination of phosphorus content in ferrochrome, silicon-chromium alloy and ferrochrome nitride - Bismuth phosphomolybdenum blue spectrophotometric method and molybdenum blue spectrophotometric method (GB/T 4699.3). The purpose is to measure the silicon content in ferrochrome, silicon chromium alloy and ferrochrome nitride, using bismuth phosphomolybdenum blue spectrophotometry.

Molybdenum blue spectrophotometry and spectrophotometry.

---Determination of carbon content of ferrochrome and silicon-chromium alloys by infrared absorption method and gravimetric method (GB/T 4699.4).

The carbon content in iron and silicon-chromium alloys is determined by infrared absorption and weight methods.

--- Determination of sulfur content of ferrochrome and silicon-chromium alloys - Infrared absorption method and combustion neutralization titration method (GB/T 4699.6).

To measure the sulfur content in ferrochrome and silicon-chromium alloy, infrared absorption method and combustion neutralization titration method are used.

---Determination of silicon content in ferrochrome, silicon-chromium alloy, ferrochrome nitride and high nitrogen ferrochrome - Silicomolybdenum blue spectrophotometry, potassium fluorosilicate titration and perchloric acid dehydration gravimetric method (GB/T 4699.8). The purpose is to measure the content of ferrochrome, silicon-chromium alloy, ferrochrome nitride and high nitrogen ferrochrome.

The silicon content was determined by molybdenum blue spectrophotometry, potassium fluorosilicate titration and perchloric acid dehydration gravimetry.

Ferrochrome, silicon-chromium alloy, ferrochrome nitride Determination of chromium content in high nitrogen ferrochromium Ammonium persulfate oxidation titration and potentiometric titration Warning. Personnel using this document should have experience in formal laboratory work practices. This document does not address all possible safety issues.

For any problems, users are 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 determination of ferrochrome, silicon-chromium alloy, ferrochrome nitride and high nitrogen ferrochrome by ammonium persulfate oxidation titration and potentiometric titration.

chromium content.

This document is applicable to the determination of chromium content in ferrochrome, silicon-chromium alloy, ferrochrome nitride and high nitrogen ferrochrome. The measurement range (mass fraction) is.

25.00%~80.00%.