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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 6730.13-2025

Replacing GB/T 6730.13-2007

Iron ores - Determination of calcium and magnesium content - EGTA-CyDTA titrimetric method

铁矿石 钙和镁含量的测定 EGTA-CyDTA滴定法

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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 13 of GB/T 6730.The previously published parts of GB/T 6730 are listed in Appendix A.

This document supersedes GB/T 6730.13-2007 "Determination of Calcium and Magnesium Content in Iron Ore - EGTA-CyDTA Titration Method", and is consistent with...

Compared with GB/T 6730.13-2007, apart from structural adjustments and editorial changes, the main technical changes are as follows.

a) Added "3 Terms and Definitions" (see Chapter 3);

b) Some reagents and preparation methods have been changed (see Chapter 5, Chapter 4 of the 2007 edition);

c) Added requirements for burettes, platinum crucibles, PTFE beakers, high-temperature furnaces, and analytical balances (see Chapter 6, 2007 edition). Chapter 5);

d) The preparation of samples from ores with high levels of bound water or easily oxidizable substances has been expanded (see 7.2.1);

e) The specific requirements for blank tests, validation tests, and assays have been changed (see Chapter 8, Chapter 7 of the 2007 edition);

f) Change the permissible difference of the test results to precision (see Chapter 9, Chapter 8 of the 2007 edition).

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Iron and Steel Association.

This document is under the jurisdiction of the National Technical Committee on Standardization of Iron Ore and Direct Reduced Iron (SAC/TC317).

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This document was first published in 2007, and this is its first revision.

Introduction

Iron ore is the main raw material for the steel industry. Within the steel industry's standard system, the standard system for determining the chemical composition of iron ore is its core component.

This series of method standards is a very important part of iron ore production and plays a vital role in ensuring the quality of iron ore products. It serves the production process of iron ore.

Production, trade, and application provide technical support for the high-quality development of China's steel industry.

GB/T 6730 includes a series of standards for the determination of chemical composition of iron ore, which describe the determination of moisture, total iron, and metal content in iron ore products.

Iron, ferrous iron, silicon, aluminum, calcium, magnesium, sulfur, phosphorus, manganese, titanium, total rare earth elements, barium, chromium, vanadium, tin, copper, cobalt, nickel, zinc, niobium, bismuth, potassium, sodium, carbon, lead, arsenic.

Methods for determining chemical components such as mercury, fluorine, chlorine, loss on ignition, and combined water.

In 1986, GB/T 6730 was the first national standard to release 51 methods for the determination of chemical composition of iron ore. This standard reflects the advancements

in analytical techniques in the iron ore field.

Based on technological development and actual production needs, and through years of continuous revision and development, a relatively complete standard system has been formed.

For details of the constituent documents of GB/T 6730, please refer to Appendix A.

Determination of calcium and magnesium content in iron ore EGTA-CyDTA titration method Warning---Personnel using this document should have practical experience working in a formal laboratory. This document does not address all possible safety issues.

Users are responsible for taking appropriate safety and health measures and ensuring compliance with relevant national regulations.

1 Scope

This document describes a method for determining the calcium and magnesium content in iron ore using EGTA-CyDTA titration.

This document applies to the determination of calcium and magnesium content in natural iron ore, iron concentrate, sinter, and pellets; determination range (mass fraction). calcium Content 1.50%~15.00%, magnesium content >=1.00%.

2 Normative references

GB/T 601

GB/T 6682

GB/T 6730.1

GB/T 8170

GB/T 10322.1

GB/T 12805

GB/T 12806

GB/T 12808

3 Terms and Definitions

This document does not contain any terms or definitions that need to be defined.

4 Principles

The sample was decomposed with hydrochloric acid and nitric acid, and then filtered. The

residue was treated with hydrofluoric acid to remove silicon (except for fluorine-containing samples), then fused with potassium pyrosulfate, and finally treated with ammonia and hydroxide.

Potassium chloride precipitates iron, aluminum, titanium, etc., as hydroxides, while manganese is oxidized to hydrated manganese dioxide by ammonium persulfate, which is then removed by filtration along with the hydroxides.

At this point, phosphorus is simultaneously separated in the form of iron phosphate.

When the pH is greater than 12, add a calcium indicator and titrate the calcium with a standard ethylene glycol diethyl ether diaminetetraacetic acid (EGTA) solution.

When the value is equal to 10, after chelating calcium with EGTA, add Black T indicator and titrate magnesium with cyclohexanediaminetetraacetic acid (CyDTA) standard titration solution.

5 Reagents

Unless otherwise specified, reagents of analytical grade (or higher) and water conforming to grade III or higher as specified in GB/T 6682 should be used in the analysis. Or water of similar purity.

5.1 Potassium pyrosulfate, fine powder.

5.2 Ammonium persulfate, solid.

5.3 Hydrochloric acid, rho~1.19g/mL.

5.4 Hydrochloric acid solution, 1 1.

The hydrochloric acid solution is prepared in a 1.1 ratio (by volume).

5.5% hydrochloric acid solution, 5.95%.

The hydrochloric acid solution ratio is 5.95 (volume ratio).

5.6 Sulfuric acid solution, 1 1.

The sulfuric acid solution is prepared in a 1.1 ratio (by volume).

5.7 Nitric acid, rho~1.42g/mL.

5.8 Hydrofluoric acid, rho~1.15g/mL.

5.9 Potassium hydroxide solution,.200 g/L, stored in a plastic bottle.

5.10 Potassium hydroxide solution, 300 g/L, stored in a plastic bottle.

5.11 Ammonia water, rho~0.90g/mL. 5.12 Ammonia solution, 1 1.

The ammonia solution ratio is 1.1 (volume ratio). 5.13 Ammonia solution, 1 3.