



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

GB/T 6730.60-2022

**Iron ores - Determination of nickel content - Flame atomic
absorption spectrometric method**

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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 of Standardization Documents" drafted.

This document is Part 60 of GB/T 6730. See Appendix A for the published part of GB/T 6730.

This document replaces GB/T 6730.60-2005 "Determination of Nickel Content in Iron Ore by Flame Atomic Absorption Spectrometry", and

Compared with GB/T 6730.60-2005, in addition to structural adjustment and editorial changes, the main technical changes are as follows.

- a) Change the measurement range to "0.001%~0.10%" (see Chapter 1, Chapter 1 of the.2005 edition);
- b) Added "hydrochloric acid-sulfuric acid-sodium carbonate-sodium tetraborate mixed solution" (see 5.13);
- c) Added "or prepared with a commercially available certified standard solution" in "Nickel standard solution A" (see 5.14, 4.13 of the.2005 edition);
- d) The temperature requirements for high temperature furnaces are added (see 6.2, 5.2 of the.2005 edition);
- e) The constant volume of the final test solution was changed, and the constant volume was increased to 50mL when the nickel content (mass fraction) was less than 0.010% requirements (see 8.4.3, 7.4.3 of the.2005 edition);
- f) Changed "Preparation of calibration solution" (see 8.4.4, 7.4.4 of the.2005 edition);

g) Changed the calculation formula of nickel content and the expression method of precision (see Chapter 9, Chapter 8 of the 2005 edition).

This document is modified by ISO 15633:2017 "Determination of Nickel in Iron Ore by Flame Atomic Absorption Spectrometry".

The technical differences of ISO 15633:2017 are as follows.

- a) In the normative cited documents, the corresponding international standards are replaced by national standards, and GB/T 8170 and GB/T 12807 are added (see Section Chapter 2);
- b) This document does not use ISO 15633:2017 "5.3 Lithium tetraborate ($\text{Li}_2\text{B}_4\text{O}_7$), anhydrous powder";
- c) This document adds the preparation of "hydrochloric acid-sulfuric acid-sodium carbonate-sodium tetraborate mixed solution" (see 5.13);
- d) Added "or prepared with commercially available certified standard solution" in "Nickel standard solution A" (see 5.14);
- e) Added "Separating funnel, 200mL" (see 6.3);
- f) Changed "8.4.4 Preparation of Calibration Solution" (see 8.4.4);
- g) Changed the expression method of precision (see Chapter 9);
- h) This document adopts the numerical rounding method given in GB/T 8170 instead of "Calculation of final result" of ISO 15633:2017.

the number rounding method (see 9.2.5).

Please note that some content of this document may be patented. The issuing agency of this document assumes no responsibility for identifying patents.

Introduction

Iron ore is the main raw material of the iron and steel industry. In the standard system of the iron and steel field, the standard system for the determination of chemical composition of iron ore is the

It plays an important role in ensuring the quality of iron ore products. This series of method standards serves the production of iron ore.

production, trade and application, and provide technical support for the high-quality development of my country's iron and steel industry.

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

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

Methods for the determination of chemical components such as cadmium, mercury, fluorine, chlorine, loss on ignition, and combined water.

In 1986, GB/T 6730 issued 51 national standards for the determination of chemical composition of iron ore for the first time.

According to the development of technology and the actual needs of production, after years of continuous formulation and revision work, a relatively complete standard system has been formed at present.

The GB/T 6730 constituent documents are detailed in Appendix A.

GB/T 6730.60 gives a method for the determination of nickel content in iron ore by flame atomic absorption spectrometry. After this revision, it is consistent with the international standard water

keep the same level.

Determination of nickel content in iron ore

flame atomic absorption spectrometry

Caution - Persons using this document should have experience in formal laboratory work. This document does not address all security issues. use

It is the responsibility of the operator to take appropriate safety and health measures and to ensure compliance with the conditions stipulated by the relevant national regulations.

1 Scope

This document specifies a method for the determination of nickel content in iron ore by flame atomic absorption spectrometry.

This document applies to the determination of nickel content in natural iron ores, iron concentrates and lumps, including sintered products. Measurement range (mass fraction).

0.001%~0.10%.

2 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, dated citations

documents, only the version corresponding to that date applies to this document; for undated references, the latest edition (including all amendments) applies to

this document.

GB/T 6682 Analysis Laboratory Water Specifications and Test Methods (GB/T 6682-2008, ISO 3696.1987, MOD)

GB/T 6730.1 Preparation of pre-dried samples for iron ore analysis (GB/T 6730.1-2016, ISO 7764.2006, MOD)

GB/T 8170 Numerical Rounding Rules and Representation and Judgment of Limit Values

GB/T 10322.1 Iron ore sampling and sample preparation method (GB/T 10322.1-2014, ISO 3082.2009, IDT)

GB/T 12806 Laboratory glass instrument single-line volumetric flask (GB/T 12806-2011, ISO 1042.1998, NEQ)

GB/T 12807 Indexing pipettes for laboratory glass instruments (GB/T 12807-1991, neqISO 835.1981)

GB/T 12808 Laboratory glass instrument single reticle pipette

3 Terms and Definitions

There are no terms and definitions that need to be defined in this document.

4 Principles

The sample was decomposed with hydrochloric acid and nitric acid, and most of the iron in the filtrate was extracted and separated with 4-methyl-2-pentanone (MIBK). The residue was ashed and calcined.

Then, use hydrofluoric acid and sulfuric acid to remove silica, and then use a mixed reagent of sodium carbonate and sodium tetraborate to melt, after cooling, leaching the melt with hydrochloric acid and

Incorporate the extract into the main solution. On an atomic absorption spectrometer, the absorbance of the test solution was measured at a wavelength of 232.0 nm with an air-acetylene flame.

Use the measured absorbance of the test solution to find out the concentration of nickel on the calibration curve of the nickel standard solution.

5 Reagents and materials

Unless otherwise specified, only use approved analytical reagents and distilled water in accordance with GB/T 6682 or its purity.

when the water.