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

GB/T 42513.6-2024

**Methods for chemical analysis of nickel alloys - Part 6:
Determination of molybdenum content - Inductively coupled
plasma atomic emission spectrometric method**

镍合金化学分析方法 第6部分：钼含量的测定 电感耦合等离子体原子发射光谱法
(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 6 of GB/T 42513 "Chemical analysis methods for nickel alloys": GB/T 42513 has been published in the following parts:

--- Part 1: Determination of chromium content by ammonium ferrous sulfate potentiometric titration method;

--- Part 2: Determination of phosphorus content-Molybdenum blue spectrophotometric method;

--- Part 3: Determination of aluminum content by nitrous oxide-flame atomic absorption spectrometry and inductively coupled plasma atomic emission spectrometry Spectrum;

--- Part 4: Determination of silicon content by nitrous oxide-flame atomic absorption spectrometry and molybdenum blue spectrophotometry;

--- Part 5: Determination of vanadium content by nitrous oxide-flame atomic absorption spectrometry and inductively coupled plasma atomic emission spectrometry Spectrum;

--- Part 6: Determination of molybdenum content - Inductively coupled plasma atomic emission spectrometry;

--- Part 7: Determination of cobalt, chromium, copper, iron and manganese content: Flame atomic absorption spectrometry:

This document is modified to adopt ISO 11435:2011 "Nickel alloys - Determination of molybdenum content - Inductively coupled plasma atomic emission spectrometry":

Compared with ISO 11435:2011, this document has many structural adjustments: The

structural number changes between the two documents are shown in the table below:

See Appendix A:

This document has many technical differences compared to ISO 11435:2011:

A single line (|) is used to indicate these technical differences: A list of these technical differences and their reasons is given in Appendix B:

The following editorial changes were made to this document:

--- In order to coordinate with the existing standards, the name of the standard is changed to "Chemical Analysis Methods for Nickel Alloys Part 6: Determination of Molybdenum Content Coupled Plasma Atomic Emission Spectrometry";

--- Added Appendix F (informative) "Original data of method 1 verification test";

--- Added Appendix G (informative) "Sample information for method 2 test and raw data of precision test":

Introduction

Nickel alloys are commonly used in instruments, electronic communications, pressure vessels, corrosion-resistant devices, aerospace and high-end special-purpose it is one of the important metal raw materials for industrial development: International standards for chemical analysis methods of nickel alloys have been published for dozens of years:

In:2008, with the progress of my country's industry, the demand for the production and import and export of high-end nickel alloy materials increased: To this end, the international standards were converted into national standards:

GB/T 42513 "Chemical Analysis Methods for Nickel Alloys" is a standard for the development and upgrading of the non-ferrous industry and the development of the domestic manufacturing industry:

In establishing a complete and feasible set of standard methods for testing chromium, phosphorus, niobium, molybdenum, aluminum, vanadium, silicon, cobalt, copper and other elements in nickel alloys, the conversion the following international standards:

---ISO 7592:2017 Nickel alloys - Determination of chromium content - Ammonium ferrous sulfate potentiometric titration method;

---ISO 9388:1992 Nickel alloys - Determination of phosphorus content - Molybdenum blue spectrophotometric method;

---ISO 7530-7:1992 Nickel alloys - Flame atomic absorption spectrometric analysis - Part 7: Determination of aluminium content;

---ISO 7530-8:1992 Nickel alloys - Flame atomic absorption spectrometric analysis - Part 8:

Determination of silicon content;

---ISO 7530-9:1993 Nickel alloys - Flame atomic absorption spectrometric analysis - Part 9: Determination of vanadium content;

---ISO 11435:2011 Nickel alloys - Determination of molybdenum content - Inductively coupled plasma atomic emission spectrometry;

---ISO 7530-1:2015 Nickel alloys - Flame atomic absorption spectrometric analysis - Part 1: Determination of cobalt, chromium, copper, iron and manganese contents;

---ISO 22033:2011 Nickel alloys - Determination of niobium content - Inductively coupled plasma atomic emission spectrometry;

---ISO 11436:1993 Nickel and nickel alloys - Determination of total boron content - Curcumin spectrophotometric method;

---ISO 23166:2018 Nickel alloys - Determination of tantalum content - Inductively coupled plasma atomic emission spectrometry;

GB/T 42513 is proposed to consist of 13 parts:

--- Part 1: Determination of chromium content by ammonium ferrous sulfate potentiometric titration method;

--- Part 2: Determination of phosphorus content-Molybdenum blue spectrophotometric method;

--- Part 3: Determination of aluminum content by nitrous oxide-flame atomic absorption spectrometry and inductively coupled plasma atomic emission spectrometry Spectrum;

--- Part 4: Determination of silicon content by nitrous oxide-flame atomic absorption spectrometry and molybdenum blue spectrophotometry;

--- Part 5: Determination of vanadium content by nitrous oxide-flame atomic absorption spectrometry and inductively coupled plasma atomic emission spectrometry Spectrum;

--- Part 6: Determination of molybdenum content - Inductively coupled plasma atomic emission spectrometry;

--- Part 7: Determination of cobalt, chromium, copper, iron and manganese content by flame atomic absorption spectrometry;

--- Part 8: Determination of niobium content by inductively coupled plasma atomic emission spectrometry;

--- Part 9: Determination of total boron content Curcumin spectrophotometric method;

--- Part 10: Determination of trace element content by glow discharge mass spectrometry;

--- Part 11: Determination of silicon, manganese, phosphorus, chromium, nickel, copper,

molybdenum, cobalt, iron, aluminum, vanadium, titanium, tungsten and niobium contents by X-ray fluorescence Spectrum;

--- Part 12: Determination of tantalum content by inductively coupled plasma atomic emission spectrometry;

--- Part 13: Determination of oxygen, nitrogen and hydrogen content - Inert gas fusion - thermal conductivity method/infrared absorption method:

Molybdenum is an important alloying element in nickel alloys: The content of molybdenum can significantly affect the performance and life of nickel alloys:

GB/T 42513.6 will promote the progress of nickel alloy testing technology in my country and ensure that the industry Industry personnel have standards to follow during production, application, scientific research and testing:

Chemical analysis methods for nickel alloys Part 6: Determination of molybdenum content Inductively coupled plasma atomic emission spectrometry Warning---People who use this document need to have practical experience in formal laboratory work: 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 describes a method for the determination of molybdenum in nickel alloys using inductively coupled plasma atomic emission spectrometry:

This document is applicable to the determination of molybdenum content in nickel alloys: Method 1 determines the content of 0.05%~20%, and method 2 determines the content of 0.05%~30.00%:

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 6682 Specifications and test methods for laboratory water (GB/T 6682-2008, ISO 3696:1987, MOD) GB/T 12806 Laboratory glassware - Single-line volumetric flasks (GB/T 12806-2011, ISO 1042:1998, NEQ) GB/T 12808 Laboratory glassware single-line pipettes