ICS 77.120.99
CCS H14

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 13747.18-2022

Replacing GB/T 13747.10-1992

Methods for chemical analysis of zirconium and zirconium alloys - Part 18: Determination of vanadium content - N-benzoyl-N-phenyl hydroxylamine spectrophotometry and inductively coupled plasma atomic emission spectrometry

锆及锆合金化学分析方法 第18部分：钒含量的测定 苯甲酰苯基羟胺分光光度法和电感耦合等离子体原子发射光谱法

Issued on: October 14, 2022 **Implemented on: February 1, 2023**

Issued by: State Administration for Market Regulation; Standardization Administration of China

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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 18 of GB/T 13747 "Methods for Chemical Analysis of Zirconium and Zirconium Alloys". GB/T 13747 has issued the following part.

1.Determination of tin content by potassium iodate titration and phenyl fluorescent copper-polyethylene glycol octyl phenyl ether spectrophotometry;

2.Determination of iron content by 1,10-phenanthroline spectrophotometry and inductively coupled plasma atomic emission spectrometry;

3.Determination of nickel content by dimethylglyoxime spectrophotometry and inductively coupled plasma atomic emission spectrometry;

4.Determination of chromium content by diphenylcarbazide spectrophotometry and inductively coupled plasma atomic emission spectrometry;

5.Determination of the amount of aluminum Chromium azurine S-tetradecylpyridine chloride spectrophotometric method;

6.Determination of copper content by 2,9-dimethyl-1,10-phenanthroline spectrophotometry;

7.Determination of manganese content by potassium periodate spectrophotometry and inductively coupled plasma atomic emission spectrometry;

8.Determination of cobalt content nitroso R salt spectrophotometry;

9.Determination of magnesium content by flame atomic absorption spectrometry and inductively coupled plasma atomic emission spectrometry;

10.Determination of tungsten content by thiocyanate spectrophotometry and inductively coupled plasma atomic emission spectrometry;

11.Determination of molybdenum content by thiocyanate spectrophotometry;

12.Determination of silicon content by molybdenum blue spectrophotometry;

1 Scope

GB/T 13747.18-2022 is the Chinese national standard on methods for chemical analysis of zirconium and zirconium alloys - part 18: determination of vanadium content - n-benzoyl-n-phenyl hydroxylamine spectrophotometry and inductively coupled plasma atomic emission spectrometry, in the field of metallurgy. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 14 October 2022 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 February 2023. Classification: ICS 77.120.99, CCS H14. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

4.1 Principle The sample is dissolved in nitric acid-hydrofluoric acid mixed acid, the excess hydrofluoric acid is complexed with boric acid, and the tetravalent vanadium is mixed with potassium permanganate in sulfuric acid medium. (V4) is oxidized to pentavalent vanadium (V5), phosphate complex matrix zirconium. In hydrochloric acid medium, benzoylphenylhydroxylamine and V5 were extracted with chloroform The resulting red complex was measured with a spectrophotometer at a wavelength of 530 nm.

4.2 Reagents or materials Unless otherwise stated, only reagents confirmed to be analytically pure were used in the analysis.

4.2.1 Water, GB/T 6682, Class II.

4.2.2 Hydrofluoric acid (rho=1.13g/mL).

4.2.3 Nitric acid (rho=1.42g/mL).

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 602 Preparation of standard solutions for the determination of impurities in chemical reagents

GB/T 6682 Analysis Laboratory Water Specifications and Test Methods

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

3 Terms and Definitions

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