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

GB/T 13747.19-2017

Replacing GB/T 13747.19-1992

**Methods for chemical analysis of zirconium and zirconium alloys - Part19:
Determination of titanium content - Dianthipyrylmethane spectrophotometry and
the inductively coupled plasma atomic emission spectrometry**

锆及锆合金化学分析方法 第19部分：钛量的测定 二安替比林甲烷分光光度法和
电感耦合等离子体原子发射光谱法

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Foreword

GB/T 13747 "zirconium and zirconium alloy chemical analysis method" is divided into 27 parts.

- Part 1. Determination of tin content potassium iodate titration and phenylfluorone - polyethylene glycol octyl phenyl ether spectrophotometry;
- Part 2. Determination of iron content 1,10-phenanthroline spectrophotometry and inductively coupled plasma atomic emission spectrometry;
- Part 3. Determination of nickel content dimethylglyoxime spectrophotometry and inductively coupled plasma atomic emission spectrometry;
- Part 4. Determination of chromium content Diphenylcarbazide spectrophotometry and inductively coupled plasma atomic emission spectrometry;
- Part 5. Determination of aluminum content chrome azure S-tetradecyl pyridine chloride spectrophotometry;
- Part 6. Determination of copper content 2,9-dimethyl-1,10-phenanthroline spectrophotometry;
- Part 7. Determination of manganese content potassium periodate spectrophotometry and inductively coupled plasma atomic emission spectrometry;
- Part 8. Determination of cobalt content Nitroso R salt spectrophotometry;
- Part 9. Determination of magnesium content by flame atomic absorption spectrometry;
- Part 10. Determination of tungsten content thiocyanate spectrophotometry;
- Part 11. Determination of molybdenum content thiocyanate spectrophotometry;
- Part 12. Determination of silicon content Molybdenum blue spectrophotometry;
- Part 13. Determination of lead content polarographic method;

1 Scope

GB/T 13747.19-2017 is the Chinese national standard on methods for chemical analysis of zirconium and zirconium alloys - part 19: determination of titanium content - diantipyrylmethane spectrophotometry and the 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 29 September 2017 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 April 2018. Classification: ICS 77.120.99, CCS H63. 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.

GB/T 13747 provisions of this part of zirconium and zirconium alloy titanium content of the determination. This section applies to sponge zirconium, zirconium and zirconium alloy titanium content determination. Method One Determination range .0.0020% ~ 0.025%; Method two The measurement range is 0.0050% ~ 0.20%. When the measurement method crosses, the second method is the arbitration analysis method.

2 Methods One or two Antipyrine Methane Spectrophotometry

2.1 Method summary The sample was decomposed with ammonium sulfate-ammonium sulfate, masked with oxalic acid, masked iron with ascorbic acid, and mixed with hydrochloric acid and sulfuric acid, titanium and diantipyryl Methane generates a yellow complex and its absorbance is measured at a spectrophotometer wavelength of 430 nm.

2.2 Reagents Unless otherwise specified, only reagents that are identified as analytically pure and laboratory-grade water are used in the analysis.

2.2.1 Ammonium sulfate.

2.2.3 Hydrochloric acid ($\rho =$

2.2.4 Hydrogen peroxide (30%, commercially available).

2.2.5 sulfuric acid (1 1).

2.2.6 Sulfuric acid (1 19).

2.2.7 Hydrochloric acid (1 11).

2.2.8 oxalic acid solution (100g/L).

2.2.9 ascorbic acid solution (100g/L), when used with the current.

2.2.10 diantipyryl methane solution (100g/L) Weigh 10g diantipyryl methane dissolved in 100mL hydrochloric acid (2.2.7).

2.2.11 titanium standard stock solution Weigh 1.0000g titanium metal ($w_{Ti} \geq 99.95\%$), with 50mL sulfuric acid (2.2.5) heated to dissolve, was added dropwise Hydrogen peroxide (2.2.4) was oxidized to colorless, cooled, transferred to a 1000mL volumetric flask, diluted to the mark with sulfuric acid (2.2.6) and mixed. This solution 1 mL contains

1.0 mg titanium.

2.2.12 Titanium standard solution Pipette 10.00mL titanium standard stock solution (2.2.11) in 1000mL volumetric flask, dilute with sulfuric acid (2.2.6) Release to the mark, mix well. 1 mL of this solution contains 10 μg titanium.

2.3 Instruments Spectrophotometer.