ICS 77.100
CCS H 11

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 24583.8-2019

Replacing GB/T 24583.8-2009

Vanadium-nitrogen alloy - Determination of the silicon, manganese, phosphorus and aluminium contents - Inductively coupled plasma atomic emission spectrometry

钒氮合金 硅、锰、磷、铝含量的测定 电感耦合等离子体原子发射光谱法

Issued on: June 4, 2019 **Implemented on: May 1, 2020**

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

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Foreword

The analysis method of GB/T 24583 vanadium nitrogen alloy is divided into 8 parts.

--- GB/T 24583.1 Determination of vanadium content of vanadium-nitrogen alloys - Ammonium sulphate titration method;

--- GB/T 24583.2 Determination of nitrogen content of vanadium-nitrogen alloys - Inert gas fusion heat conduction method;

--- GB/T 24583.3 Determination of nitrogen content of vanadium-nitrogen alloys - Distillation - Neutralometric titration;

--- GB/T 24583.4 Determination of carbon content of vanadium-nitrogen alloys - infrared absorption method;

--- GB/T 24583.5 Determination of phosphorus content of vanadium-nitrogen alloys - bismuth phosphorus molybdenum blue spectrophotometric method;

--- GB/T 24583.6 Determination of sulfur content of vanadium-nitrogen alloys by infrared absorption method;

--- GB/T 24583.7 Determination of oxygen content of vanadium-nitrogen alloys - infrared absorption method;

--- GB/T 24583.8 Determination of silicon, manganese, phosphorus and aluminium content of vanadium-nitrogen alloys by inductively coupled plasma atomic emission spectrometry. This part is the eighth part of GB/T 24583. This part is drafted in accordance with the rules given in GB/T 1.1-2009. This part replaces GB/T 24583.8-2009 "Vanadium nitrogen alloy silicon, manganese, phosphorus, aluminum content determination inductively coupled plasma atom Emission Spectroscopy. Compared with GB/T 24583.8-2009, the main technical changes in this section are as follows:

--- Revised the determination range of phosphorus (see Chapter 1, Chapter 1 of the.2009 edition);

---Modified "normative references" (see Chapter 2, Chapter 2 of the.2009 edition);

--- Added 3 sets of standard solution preparation (see 4.8, 4.9, 4.10);

--- Revised the method of preparation and preparation of the sample (see Chapter 6, Chapter 6 of the.2009 edition);

--- Modified the amount of potassium carbonate-boric acid mixed flux (see 7.4.1.2,

1 Scope

China's national method for determining silicon, manganese, phosphorus and aluminium in vanadium-nitrogen alloy by inductively coupled plasma atomic emission spectrometry. It is Part 8 of GB/T 24583 and specifies the determination of these four elements in the alloy. The four are the residuals of the product, and grouping them into one instrumental method is the practical answer to a problem the rest of the series creates: each of the classical parts determines one element by its own chemistry, on its own portion, in its own morning. A works laboratory checking a delivery needs all four, and doing them separately is four times the work for a result that is wanted the same day. So this part dissolves the sample once and measures all four simultaneously against matrix-matched calibration. Each of the four is there for a reason. Phosphorus embrittles the steel and cannot be removed after the addition is made. Silicon and aluminium are deoxidisers that arrive uninvited: they consume oxygen and change the inclusion population and, in a steel already killed to a specification, an unplanned aluminium addition alters both the grain size and the castability. Manganese is usually harmless but is counted, because it appears in the steel analysis and the mass balance has to close. What the standard has to fix is the decomposition of a hard nitride, the heavy vanadium matrix and the spectral interferences it produces across the useful lines of all four analytes, the matrix matching of the calibration solutions, the internal standardisation, and the working ranges and precision for each element. Issued on 4 June 2019 and in force since 1 May 2020, it replaces GB/T 24583.8-2009.

This part of GB/T 24583 specifies the determination of silicon, manganese, phosphorus and aluminum in vanadium-nitrogen alloy by inductively coupled plasma atomic emission spectrometry. content. This section applies to the determination of silicon, manganese, phosphorus and aluminum in vanadium-nitrogen alloys. Measuring range (mass fraction). silicon, aluminum. 0.010%~ 1.00%; manganese. 0.010% to 0.500%; phosphorus. 0.010% to 0.100%.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article. Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 6379.1 Accuracy of measurement methods and results (accuracy and precision) Part 1. General and definition

GB/T 6379.2 Accuracy of measurement methods and results (accuracy and precision) Part 2. Determination of standard method of measurement Basic method of sex and reproducibility

GB/T 6682 Analytical laboratory water specifications and test methods

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

GB/T 12806 laboratory glass instrument single standard line volumetric flask

GB/T 12807 laboratory glass instrument indexing pipette

GB/T 12808 laboratory glass instrument single standard line pipette

GB/T 20567 vanadium nitrogen alloy

3 Principle

After heating most of the sample with nitric acid, it is filtered, and the filtrate is stored as a main liquid; after the residue is burned, it is melted with potassium carbonate-boric acid mixed flux. The solution is immersed in hydrochloric acid and hydrochloric acid, and the obtained solution is combined with the main solution to make a constant volume. Introduce the test solution into an inductively coupled plasma atomic emission spectrometer to measure each element The intensity of the corresponding wavelength is calculated according to the calibration curve regression equation.

4 Reagents and materials

In the analysis, unless otherwise stated, only approved high-grade pure reagents and distilled water of Grade II and above in accordance with GB/T 6682 are used. Or deionized water or water of equivalent purity.

4.1 Vanadium pentoxide, the purity is not less than 99.99%.

4.2 Potassium carbonate-boric acid mixed flux. The fine anhydrous potassium carbonate and boric acid were mixed at a mass ratio of

1.1 and stored in a desiccator.