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

GB/T 223.11-2008

**Iron, steel and alloy -- Determination of chromium content --
Visual titration or potentiometric titration method
(English Translation)**

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Foreword

This Part of GB/T 223 replaces GB/T 223.11 - 1991 "Methods for Chemical Analysis of Iron, Steel and Alloy - The Ammonium Persulfate Oxidation Volumetric Method for the Determination of Chromium Content".

In this revision, the name of this Part is changed to "Iron, Steel and Alloy-Determination of Chromium Content-Visual Titration or Potentiometric Titration Method", including two analysis methods. method I visual titration method and method II potentiometric titration method.

Compared with GB/T 223.11 - 1991, method I of this Part has the following main revisions.

- modified the content range of determination;
- added the content related to correct vanadium interference by theoretical calculation method;
- modified the description content for reagents and water in the analysis is added, and the expression method for solution concentration;
- modified the specimen quantity and its expression;
- added quantity units in result calculation formulae are revised, and calculation formula for correcting vanadium interference by theoretical calculation method;

- re-organized precision test.

Method II in this Part is modified in relation to ISO 4937. 1986 "Steel and iron -- Determination of chromium content -- Potentiometric or visual titration method".

Compared with ISO 4937. 1986, it has the following main revisions.

- only potentiometric titration method therein is adopted, and the technical contents are consistent with it;
- a note is added respectively to "instrument" and "titration of specimen containing vanadium".

Annex A, Annex B and Annex C in this Part are informative.

This Part was proposed by China Iron and Steel Association.

This Part shall be under the jurisdiction of National Technical Committee on Iron and Steel of Standardization Administration of China.

The drafting organizations of this Part. Central Iron & Steel Research Institute, Taiyuan Iron and Steel Company.

Main drafters of this Part. Wang Kejuan, Chang Xiaojun, Luo Qianhua, Dai Xueqian.

Versions of standard substituted by this Standard are.

- GB/T 223-1963, GB/T 223.11-1982, GB/T 223.11-1991.

Iron, steel and alloy - Determination of chromium content -

Visual titration or potentiometric titration method

WARNING. the personal using this Part of GB/T 223 shall have the practical experience of regular laboratory working. This Part does not point out all possible safety problems. The users are under the obligation to adopt proper safety and health measures and shall ensure meet the requirements specified in national relevant regulations.

1 Scope

This Part of GB/T 223 specifies the determination of chromium content with visual titration or potentiometric titration method.

Method I of this Part is applicable to the determination of chromium content with mass fraction 0.10%~35.00% in pig iron, carbon steel, alloy steel, high-temperature alloy and precision alloy; method II of this Part is applicable to the determination of chromium content with mass fraction 0.25%~35.00% in iron and steel.

2 Normative references

The following standards contain provisions which, through reference in this Part of GB/T 223, constitute provisions of this Part. For dated reference, subsequent amendments to (excluding correction to), or revisions of, any of these publications do not apply. However, the parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards. For undated references, the latest edition of the normative document referred to applies.

GB/T 223.13, Methods for chemical analysis of iron, steel and alloy - The ammonium ferrous sulfate titration method for the determination of vanadium content

GB/T 223.14, Methods for chemical analysis of iron, steel and alloy - The N-benzoyl-N-phenylhydroxylamine extraction photometric method for the determination of vanadium content

GB/T 223.76, Methods for chemical analysis of iron, steel and alloy - The flame atomic absorption spectrometric method for the determination of vanadium content

GB/T 6379.1, Accuracy (trueness and precision) of measurement methods and results - Part 1. General principles and definitions (GB/T 6379.1-2004, ISO 5725-1. 1 994, IDT)

GB/T 6379.2, Accuracy (trueness and precision) of measurement methods and results - Part 2. Basic method for the determination of repeatability and reproducibility of a STANDARD measurement method (GB/T 6379.2-2004, ISO 5725-2. 1994, IDT)

GB 12805, Laboratory glassware - Burettes

GB 12806, Laboratory glassware-one-mark volumetric flasks GB 12808

Laboratory glassware - One-mark pipettes

GB/T 20066, Steel and iron - Sampling and preparation of samples for the determination of chemical composition (GB/T 20066-2006, ISO 14284. 1996, IDT)

GB/T 20125, Low-alloy steel - Determination of multi-element contents - Inductively coupled plasma atomic emission spectrometric method

3.1 Principle

After the specimen is dissolved by acid, chromium is oxidized to chromium (VI) by ammonium persulfate using silver nitrate as the catalyst in the medium of sulfuric acid and phosphoric acid, and titrated by ferrous ammonium sulfate standard solution.

The specimen containing vanadium, using ferrous-phenanthroline solution as the indicator, is added with excess ferrous ammonium sulfate standard titration solution, and back titrated with potassium permanganate solution; or is determined by proper national vanadium standards and corrected for interference of vanadium with theoretical calculation method.

There is below 2 mg of cerium noninterference determination in the test solution.

3.2 Reagents

Unless otherwise specified, during the analysis, only confirmed analytical reagent and distilled water, deionized water or equivalent purity water are used.

3.2.9 Sulfuric acid - phosphoric acid mixture. add 320mL of sulfuric acid (3.2.6) and 80mL of phosphoric acid (3.2.5) in 600mL of water, and blend.

3.2.10 Silver nitrate solution, 10g/L. weigh out 1.0g of silver nitrate, dissolve in 100mL of water, dropwise add several drops of nitric acid (3.2.4), and store in a brown bottle.