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GB/T 11261-2006

Replacing GB/T 11261-1989

Steel and Iron – Determination of Oxygen Content – The Pulse Heating Inert Gas Fusion-Infrared Absorption Method

钢铁 氧含量的测定 脉冲加热惰气熔融—红外线吸收法

Issued on: March 2, 2006 **Implemented on: September 1, 2006**

Issued by: General Administration of Quality Supervision, Inspection and Quarantine;
Standardization Administration of PRC.

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Foreword

This Revision of this Standard mainly modified the following contents:

--- Modified the standard name;

--- Added “7 Preparation of Apparatus”;

--- Added “10 Test Report”;

--- Added Appendix A;

--- Original 1, modified the name and contents of this Chapter;

--- Original 2, modified the normative references of this Chapter;

--- Original 3, modified the name of this Chapter;

--- Original 6, modified the name of this Chapter;

--- Original 7 is changed into 8, modified the contents of this Chapter;

--- Original 8 is changed into 9, modified the contents of this Chapter.

This Standard replaced GB/T 11261-1989 *Methods for Chemical Analysis of High Carbon Chromium Bearing Steel; the Pulse Heating Inert Gas Fusion; Infra-Red Absorption Method for the Determination of Oxygen Content.*

Appendix A of this Standard is informative.

This Standard was proposed by China Iron and Steel Industry Association.

This Standard shall be under the jurisdiction of National Technical Committee for Standardization of Steel.

Drafting organizations of this Standard: Baosteel Group Shanghai No.5 Steel Co., Ltd..

Participating drafting organizations of this Standard: National Center for Quality Supervision & Testing of Iron and Steel, Wuhan Iron and Steel (Group) Corporation, Baosteel Group Shanghai Iron and Steel Research Institute, Baosteel Group Shanghai No.1 Steel Co., Ltd., Shandong Metallurgical Science Research Institute, Shanghai Research Institute of Materials, and Fushun Special Steel Co., Ltd..

Chief drafting staffs of this Standard: Wang Yujuan, Cui Qiuhong, Fan Yongfei, and Yu Xinxia.

This Standard was first-time published in 1989.

Steel and Iron – Determination of Oxygen Content – The Pulse Heating Inert Gas Fusion-Infrared Absorption Method

1 Scope

This Standard specifies using the pulse heating inert gas fusion-infrared absorption method to determine the oxygen content in the steel and iron.

This Standard is applicable to the determination of oxygen content with mass fraction of 0.0005%~0.020% in the steel and iron.

2 Normative References

The provisions in following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrigendum) or revisions do not apply to this Standard, however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 6379 (all Parts) Accuracy (Trueness and Precision) of Measurement Methods and Results

3 Principles

Put the pre-prepared test materials into the graphite crucible in the helium (or argon) airflow; use low-voltage AC to directly heat to about 2300°C to fuse; the oxygen in the test materials is precipitated in the form of carbon monoxide (or through heating 400°C rare earth copper oxide to change into carbon dioxide); introduce the infrared detector to determine.

4 Reagents and Materials

4.1 Helium (or argon) gas with purity 99.99% above.

6 Sampling and Sample Preparation

6.1 The specimen shall be machine-made a round bar with Φ (4~5) mm, length greater than 30mm, surface roughness *Ra* 3.2μm above. Polish the silicon carbide emery cloth and deerskin successively at the speed of about 800r/min till *Ra* is 1.6μm above; after polishing, cut off the end with thread cutter, cut off the required length; then clean with carbon tetrachloride (or ether) and acetone (4.4) successively in the ultrasonic cleaner for 3min~7min; dry with hot air, and place in the dryer for backup.

6.2 Specimen shall be prevent oxidation and contamination during the operating period, machine-making shall be performed at speed of 800r/min to add coolant; turning tool and thread cutter shall be cleaned by carbon tetrachloride (or ether) (4.3) in advance.

6.3 The bottom specimen through washing shall be taken by the tweezers rather than touch with hand.

NOTE: When determining the high content of oxygen, other methods can also be used to remove the oxygen attached on the specimen surface.

7 Preparation of Apparatus

7.1 The apparatus shall be in the normal state before analysis.

7.2 Check with oxygen certified standard material (4.10) before analysis; the standard oxygen content of the used material shall be slightly greater than the oxygen content of analyzed specimen; the extreme deviation value among three calibration values is less than the repeatability value; otherwise re-calibrate.

8 Analytical Procedures

8.1 Test materials

Weigh 0.5g~1.0g of specimen, accurate to 1mg.

8.2 Blank test

The determination of blank value shall firstly return the blank value of original storage to zero; then perform the blank test according to the apparatus specified procedures and provisions of 8.3.2. If the determined oxygen content ≤0.0030%, the blank value shall be less than 0.00005%.

8.3 Determination

10 Test Report

The test report shall contain the following contents:

a) All materials required by identifying the sample, laboratory, and test date;

b) The used standards and methods;

c) Test results and expressions;

d) Abnormal phenomena observed during the test period;

e) Any operations beyond this Standard, or that may influence the results.

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