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

GB/T 4164-2008

Replacing GB/T 4164-2002

**Metallic powders -- Determination of hydrogen reducible
oxygen content**

金属粉末中可被氢还原氧含量的测定

(English Translation)

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Foreword

This standard is identical with ISO 4491-3:1997 "Determination of metal powder reduction of oxygen content - Part 3. hydrogen reducible oxygen" (English Chinese Version).

This standard 4491-3 ISO .1997 The main changes are as follows.

--- Deleted the original introduction of international standards, and made a small editorial changes;

--- Chapter 9 of the representation in Table 3 values were adjusted.

This standard is GB/T 4164-2002 "metal powder can be measured by hydrogen reduction of oxygen content" amendment. Revision, major changes as follows.

--- Inaccurate representation of the former version of the standard of local and typos have been modified;

--- Increasing the standard tables in the title;

--- The 7.5.1 "7.3.4 It is after the adjustments" with the words "If the power measurement end, the advance shall be adjusted 7.3.4 Section Calibrator ";

--- The 8.1 "Carl Philip Hugh test agent" to "Carl Philip Hugh agent." Since the implementation of this standard replaces GB/T 4164-2002.

This standard is proposed and managed by China Machinery Industry Federation.

This standard was drafted. Beijing Institute of powder metallurgy limited liability company.

1 Scope

This standard describes the determination of the oxygen content (mass fraction) of 0.05% to 3% of the metal powder may be hydrogen reduction of oxygen.

This method is suitable for unalloyed, partially alloyed and fully alloyed metal powders, also suitable for mixed carbide and metal bonding Thereof. It does not apply powder contains a

lubricant or an organic binder.

By using a dedicated catalytic devices, the method may be extended to a carbonaceous powder for measurement.

ISO 4491 should be read in conjunction with ISO 760 and ISO 4491-1.

2 Normative references

The following documents contain provisions which, through reference in this standard and become the standard terms. For dated references, subsequent Amendments (not including errata content) or revisions do not apply to this standard, however, encourage the parties to the agreement are based on research Whether the latest versions of these documents. For undated reference documents, the latest versions apply to this standard.

ISO 760. Carl Philip Hugh method (general method) 1978 water determination ISO 4491-1. 1989 to determine the oxygen content of the metal powder by reduction methods - Part 1. General Principle 3 Specimen at a low temperature (170 °C) and dried in dry nitrogen or argon.

At a given temperature in pure hydrogen stream dried sample was heated. Reaction with hydrogen oxide, the resulting water is absorbed methanol.

Karl Fey Hugh titration reagents, by changing the color of visual observation or double electrode measuring method (dead stop point) to determine the end point.

For the carbon powder, a nickel catalyst at 380 °C will generate carbon monoxide and carbon dioxide into methane and water.

4 Reagents

During the analysis, use only recognized analytical reagent, the water is distilled water or water of equivalent purity.

Warning. Carl Philip Hugh reagent containing four kinds of toxic compounds. iodine, sulfur dioxide, pyridine and methanol, to avoid direct contact, especially Avoid inhalation. When accidental spills, rinse with plenty of water.

4.1

anhydrous methanol.

4.2

Carl Philip Hugh agent per ml of solution equivalent to 1mg oxygen.

Use either of the following methods can be determined titer Carl Philip Hugh agent.

a) titration to 20mg ~ 30mg vial was added water to the nearest 0.1mg;

b) adding powdered 100mg ~ 200mg and at $105\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ dried to a stable quality sodium tartrate [qualified Theoretically containing material (mass fraction) 15.16% of water, the equivalent of (mass fraction) 13.92% oxygen]. Accurate to 0.1mg.

c) according to the method shown in Chapter 7, take 100mg ~ 200mg of pure sodium tartrate, weighed to the nearest 0.1mg, as a standard sample, will it is heated at $170\text{ }^{\circ}\text{C}$ to release water of crystallization contained in, followed by titration of the resulting water.

See detailed standard procedure ISO 760.

4.3

hydrogen. oxygen content of not more than 0.005% (mass fraction), dew point no greater than $-45\text{ }^{\circ}\text{C}$.

4.4

nitrogen or argon. oxygen content of not more than 0.005% (mass fraction), dew point no greater than $-45\text{ }^{\circ}\text{C}$.

4.5

Desiccant. granular anhydrous sodium aluminum silicate, activated silica gel or magnesium perchlorate.

5 Instruments

Note: You can use the instrument installation method are shown in Figure 1 (1) and 2 (Method 2).

GB/T 4164-2008/ISO 4491-3:1997