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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 37623-2019

Corrosion of metals and alloys - Aqueous corrosion testing of zirconium alloys for use in nuclear power reactors

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard uses the redrafting method to modify the ISO 10270.1995 "Zirconium alloy aqueous solution for corrosive nuclear reactors of metals and alloys.

Corrosion test.

There are technical differences between this standard and ISO 10270.1995, and the terms involved in these differences have been passed through the margins on the outer side of the page.

The vertical single line (|) is marked, and a list of the corresponding technical differences and their causes is given in Appendix B.

This standard has a structural change compared with ISO 10270.1995, and the suspension section of ISO 10270.1995 is set to the number "7.1";

The article number "7.1~7.11" of ISO 10270.1995 was changed to "7.2~7.12".

Compared with ISO 10270.1995, this standard also made the following editorial changes.

---Incorporated ISO 10270.1995/Corrigendum 1.1997.

This standard was proposed by the China Iron and Steel Association.

This standard is under the jurisdiction of the National Steel Standardization Technical Committee (SAC/TC183).

This standard was drafted. National Nuclear Zirconium Physicochemical Testing Co., Ltd., Metallurgical Industry Information Standards Institute.

1 Scope

This standard specifies zirconium and zirconium alloys at a pressure of 18.6 MPa, in high pressure water at 360 ° C, or at a pressure of 10.3 MPa.

Appearance inspection and corrosion weight gain after corrosion in water vapor at 400 ° C and above.

This standard applies to forgings, castings, powder metallurgy products and welding metals.

As a means of evaluating the properties of materials, this standard is applicable to the evaluation of new alloy development, heat treatment and welding technology.

Inspection and acceptance of the product.

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 7489-1987 Determination of dissolved oxygen in water - Iodometric method (ISO 5813.1983, IDT)

HJ506-2009 Determination of dissolved oxygen in water - Electrochemical probe method (ISO 5814..1990, IDT)

3 Terms and definitions

The following terms and definitions apply to this document.

3.1

Pickling etching

The process of removing metal surface oxides by chemical reaction in an acid solution.

3.2

Control sample controlcoupons

Properties are known as zirconium alloy coupons for monitoring the effectiveness of corrosion tests.

3.3

High weight gain sample highmassgaincoupons

The specially heat-treated zirconium alloy sample has a corrosion weight gain higher than the maximum value specified in the technical conditions, and is used to verify the detection

process.

Effectiveness.

4 Principle

Zirconium and zirconium alloy samples are placed at a certain temperature, water having a pressure of 18.6 MPa or water vapor having a pressure of 10.3 MPa.

72h or 336h corrosion test. The corrosion properties of zirconium and zirconium alloys are evaluated according to the corrosion weight gain and the appearance of the oxide film; in some cases, such as

Corrosion weight measurement is not applicable or necessary during weld evaluation. Corrosion of zirconium and zirconium alloy welding specimens can be evaluated according to the appearance of oxide film.

performance.

5 matters needing attention

5.1 Carefully pickle and clean the sample. When the surface of the pipe to be tested has a coating layer, the coating layer should be removed before the test.