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

GB/T 18175-2000

**Determination of corrosion inhibition performance of water
treatment agents - Rotation specimen method
(English Translation)**

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Foreword

This Standard non-equivalently adopts ASTM G31-1995 Laboratory Metal Materials Impregnation and

Corrosion Test Standard.

This Standard is different from ASTM G31-1995, because it specifies using the rotation specimen

method to determine the corrosion inhibition performance of water treatment agents for metal

materials.

Since the date of implementation of this Standard, it will replace HG/T 2159-1991 Determination of

Corrosion Inhibition Performance of Water Treatment Agents-Rotation Specimen Method.

Appendix A of this Standard is the standard appendix.

Appendix B of this Standard is suggestive appendix.

This Standard is proposed by the Ministry of Chemical Industry of the People's Republic of China.

This Standard is under the jurisdiction of the Branch of Water Treatment Agents of the National

Chemical Standardization Technology Committee.

This Standard is drafted by organization. Guangming Chemical Industry Research and Design

Institute.

1 Scope

This Standard specifies the laboratory method of using the rotation specimen method to determine the

corrosion inhibition performance of water treatment agents.

This Standard applies to the determination of corrosion inhibition performance of water treatment

agents.

2 Normative references

The following standards contain provisions which, through reference in this text, become part of this

Standard. At the time of publication of this Standard, all editions indicated are valid. All standards are

subject to revision. Parties who enter into agreements based on this Standard are encouraged to

investigate the possibility of applying the most recent editions of the standards indicated below.

GB/T 603-1988 Chemical reagents - Preparation of chemical reagents and products used in the test

method

GB/T 6682-1992 Analysis of water specifications and test methods of laboratory (neq ISO 3696:1986)

GB/T 15724.1-1995 Laboratory glassware - beaker

HG/T 3523-1985 Technical conditions on standard corrosion specimens for chemical treatment of

cooling water.

3 Method summary

The rotation specimen corrosive test method is conducted under the given laboratory conditions,

calculates the corrosion rate and inhibition rate to evaluate the corrosion inhibition performance of

water treatment agents by using the quality loss of test specimen.

7.8 USE brush to clean the test specimen, then SOAK into acid pickling solution (4.5) for 3-5 minutes.

TAKE out, after quickly washing with tap water, then immediately IMMERSE into NaOH (4.4) solution

for 30s. TAKE out, WASH with distilled water, USE filter paper to clean and dry, SOAK into the absolute

ethyl alcohol for about 3 minutes, PLACE onto the clean filter paper, PLACE in the dryer for over 4

hours, and WEIGH it (accurate to 0.0002g).

Do the pickling blank test of the specimen at the same time.

8 Result expression and calculation

8.1

Corrosion rate X_1 is expressed in mm/a, and it shall be calculated according to Formula (1).

Where.

m - Specimen mass loss, g;

m_0 - Average mass loss value of the blank test of specimen pickling;

s - Surface area of the specimen, cm^2 ;

ρ - Density of the specimen, g/cm^3 ;

t - Test time, h;

10 - Millimeter number equivalent to 1cm, mm/cm.

8.2 Corrosion inhibition rate X_2 is expressed in percentage, and it shall be calculated according to

Formula (2).

Where.

Appendix A

(Normative)

Recommended standard preparation water

A1 Reagents and materials

A1.1 Anhydrous calcium chloride.

A1.2 Magnesium sulfate monohydrate.

A1.3 Sodium hydrogen carbonate.

A1.4 Sodium chloride.

A2 Preparation of standard preparation water

WEIGH 7.35g of calcium chloride dihydrate (A1.1), 4.93g of magnesium sulfate heptahydrate (A1.2)

and 6.58g of NaCl (A1.4), DISSOLVE them into 7L of water, MIX well after complete dissolution.

WEIGH another 1.68g of sodium bicarbonate (A1.3) and DISSOLVE it into 1L of water, MIX well after

complete dissolution. TRANSFER the solution to above solution, USE water to dilute to 10.0L, MIX

well.

Appendix B

(Normative)

Corrosion Rate Conversion Table

Conversion unit

Given Unit

(mm/a) $\text{g}/(\text{m}^2 \cdot \text{h})$ $\text{mg}/(\text{dm}^3 \cdot \text{d})$

mm/a 1 $0.114 \times \rho$ $27.4 \times \rho$

$\text{g}/(\text{m}^2 \cdot \text{h})$ $8.76/\rho$ $1\ 240$

$\text{mg}/(\text{dm}^3 \cdot \text{d})$ $3.65 \times 10^{-2}/\rho$ $4.17 \times 10^{-3}\ 1$

Note: ρ is the specimen density, g/cm^3 .

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