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

GB/T 6904.1-1986

Replacing GB/T 6904-2008

**Determination of pH in water for industrial recirculating cooling
system and boiler
(English Translation)**

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document supersedes GB/T 6904-2008 "Determination of pH in Industrial Circulating Cooling Water and Boiler Water", and is consistent with GB/T 6904-2008.

In comparison, aside from structural adjustments and editorial changes, the main technical changes are as follows.

---The word "reagents or materials" has been changed (see Chapter 5, Chapter 4 in the 2008 edition);

---The requirement for "thermometer (temperature measurement probe)" has been added (see 6.3);

---The requirement for "sample containers" has been added (see 6.4);

---A "General Requirements" section has been added (see Chapter 7);

---The "Experimental Procedure" has been revised (see Chapter 8, Chapter 6 of the 2008 edition);

---The pH values of the standard buffer solutions at different temperatures have been changed (see Appendix A, Table 1 of the 2008 edition).

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Petroleum and Chemical Industry Federation.

This document is under the jurisdiction of the National Technical Committee on Chemical Standardization (SAC/TC63).

1 Scope

This document describes a method for pH determination in industrial circulating cooling water and boiler water.

This document applies to the determination of pH in industrial circulating cooling water and boiler water within the range of 0-14, and is also applicable to natural water and wastewater.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

GB/T 603 Preparation of reagents and products used in chemical reagent test methods
GB/T 6682-2008 Specifications and test methods for water used in analytical laboratories
GB/T 6907 Methods for the Analysis of Boiler Water and Cooling Water - Water Sampling Methods
GB/T 27501-2011 Preparation of buffer solutions for pH determination

3 Terms and Definitions

This document does not contain any terms or definitions that need to be defined.

4 Principles

Immersing the indicator electrode and reference electrode or a combined electrode in the same solution to be tested forms a galvanic cell, the electromotive force of which corresponds to the pH of the solution.

The Nernst equation allows us to determine the pH of a solution by measuring the electromotive force of a galvanic cell.

5 Reagents or materials

Unless otherwise specified, the reagents and water used in this document shall be of analytical grade and conform to Grade III water as specified in GB/T 6682-2008.

Unless otherwise specified, the preparations and products required for the experiment shall be prepared in accordance with the provisions of GB/T 603.

5.1

Water without carbon dioxide.

5.2

Potassium trihydrogen oxalate standard buffer solution. $c[\text{KH}_3(\text{C}_2\text{O}_4)_2 \cdot 2\text{H}_2\text{O}] = 0.05 \text{ mol/L}$. According to GB/T 27501-2011, Prepare according to the provisions of 5.3.2a). Or purchase commercially available pH standard buffer solutions.

Commercially available pH standard buffer solution.

5.4

Potassium hydrogen phthalate standard buffer solution. $c(\text{KHC}_8\text{H}_4\text{O}_4) = 0.05 \text{ mol/L}$. According to GB/T 27501-2011, 5.3.2c) Prepare according to specifications. Alternatively, purchase commercially available pH standard buffer solutions.

5.5

Mixed phosphate standard buffer solution. $c(\text{KH}_2\text{PO}_4) = 0.025 \text{ mol/L}$; $c(\text{Na}_2\text{HPO}_4) = 0.025 \text{ mol/L}$. (According to...) Prepare according to the provisions of GB/T 27501-2011, 5.3.2d. Alternatively, purchase commercially available pH standard buffer solutions.