

ICS 71.040.30

CCS G60



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

GB 6851-2008

Replacing GB 6851-1986

pH primary reagent - General rules for certification

pH基准试剂 定值通则

Issued on: June 18, 2008

Implemented on: June 1, 2009

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China;
Standardization Administration of China**

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Foreword

The standard 5.2, Chapter 6, Chapter 7, Chapter 8 is mandatory, the rest are recommended. This standard replaces GB 6851-1986 "pH value reference reagent Law", compared with GB 6851-1986 The main changes are as follows:

- Modify the "Range" (1986 edition Chapter 1, Chapter 1 of this edition);
- "Terminology" added "a reference standard material", the "a reference reagent pH" is replaced by "pH standard reference material", the "a Level pH standard buffer solution "to" pH reference buffer solution "(1986 edition Chapter 2, Chapter 3 of this edition);
- Modify the "Instrument" chapter (1986 edition, Chapter 4, Chapter 6 of this edition);
- Modify the "Reagents and Materials" chapter (1986 edition Chapter 5, Chapter 5 of this edition);
- Modify the "Calculate" chapter (1986 edition, Chapter 7, Chapter 8 of this edition);
- Increased (Chapter 9 of this edition) "pH standard buffer solution of pH value (pH (S) II) expanded uncertainty";
- Revised Appendix A, Appendix B (1986 edition Appendix A, Appendix B, Appendix C, this edition of Appendix A, Appendix B);

--- Added "expanded uncertainty calculated pH standard buffer solution pH value" (Excerpts Appendix C). This standard Annex A, Annex B is normative appendix, Appendix C is informative appendix. The standard proposed by China Petroleum and Chemical Industry Association. This standard by the Chemicals Branch of the National Chemical Standardization Technical Committee. This standard is drafted by: China Institute of Metrology, Beijing Institute of Chemical reagents. The main drafters of this standard. repair Hongyu, Han Baoying. This standard replaces the standards previously issued as follows:

--- GB 6851-1986.

1 Scope

GB 6851-2008 is the Chinese national standard on pH primary reagent - general rules for certification, in the field of chemical technology. It carries no /T suffix, which in the Chinese system means compliance is mandatory: a product or a practice within its scope has to meet it to be lawfully made, sold or carried out in China. It was issued on 18 June 2008 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 June 2009. Classification: ICS 71.040.30, CCS G60. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This method is applicable to the liquid junction cell measuring pH electrode dihydrotestosterone reference reagent pH value (25 °C).

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. GB Preparation (GB/T 601-2002,

ISO 6353-1. 1982, NEQ)/T 601 chemical reagent standard titration solution

GB/T 603 chemical reagent test method Preparations of articles (GB/T 603-2002,

ISO 6353-1 with. 1982, NEQ)

GB/T 6682 analytical laboratory use specifications and test methods (GB/T 6682-2008, ISO 3696. 1987, MOD)

3 Terms and Definitions

The following terms and definitions apply to this standard.

3.1 Having the highest metrological characteristics of the reference method for determining standard substance characteristic values, referred to reference material. Reference material is normally provided by States House calibration laboratory research, values traceable to SI units, and the organization of international verification by international comparison measurement, achieved an equivalent degree.

3.2 Reference silver/silver chloride electrode, liquid junction cells without reference method, the aqueous solution pH (acidity) reference means of the set value - platinum (palladium) hydrogen Standard material. It is commonly used reference reagent and pH value two pH standard materials and high-precision pH meter verification/calibration.

3.3 To measure pH standard reference material based on hydrochlorothiazide liquid junction electrodes and battery comparison value chemicals. It uses At pH meter calibration.

3.4 Buffer solution with pH standard reference material prepared according to the method prescribed.

3.5 Reference reagent with a pH buffer solution prepared as prescribed.

3.6 With a pH value of

3.2 baseline methodology buffer pH value of the solution.

3.7 With a pH value of

3.3 standard methods of buffer pH value of the solution.

4 principle of the method

The general rule in four standard pH value of the buffer solution with the existing four pH reference buffer solution of the same name, with concentrations Etc., so can be used in response to the hydrogen electrode in a solution of hydrogen ions, the pH reference buffer solutions and pH buffer solution into the same measurement standard Battery (liquid junction electrodes dihydrotestosterone cell) measurements were compared to determine the magnitude of the pH standard buffer solution. The measuring cell is as follows: Pt (Pd), hydrogen (gas) pH reference Buffer solution Saturated potassium chloride pH standard Buffer solution Hydrogen (gas), platinum (Pd) At a constant temperature, according to the Nernst (Nernst) equation. Left half-cell potential is. $E_I = -\ln 10 \cdot R \cdot T \cdot \text{PH}(\text{S}) \text{ I} + E_{\text{Jl}}$ (1) Right half-cell potential is. $E_{\text{II}} = -\ln 10 \cdot R \cdot T \cdot \text{PH}(\text{S}) \text{ II} + E_{\text{JII}}$ (2) Where. E_{Jl} and E_{JII} to the left and right battery liquid junction potential, respectively. Electromotive force E is. $E = E_I - E_{\text{II}} = -\ln 10 \cdot R \cdot T [\text{PH}(\text{S}) \text{ I} - \text{pH}(\text{S}) \text{ II}] + (E_{\text{Jl}} - E_{\text{JII}})$ (3) Order $\Delta E_{\text{J}} = E_{\text{Jl}} - E_{\text{JII}}$ pH (S) I - pH (S) II = -

$F \cdot (E - \Delta E_j) \ln 10 \cdot R \cdot T$ (4) Then, pH standard buffer solution of pH value (pH (S) II) by the formula (5) is calculated. $\text{pH (S) II} = \text{pH (S) I} + F \cdot (E - \Delta E_j) \ln 10 \cdot R \cdot T$ (5) Where. pH (S) I

--- pH value of the reference buffer solution of pH;

--- Faraday constant F , Units of coulombs per mole (C/mol); E

--- electromotive force in volts (V); ΔE_j

--- residual liquid junction potential, in volts (V);

--- Gas constant R & It joules per (open Moore) (J/mol · K); T

--- thermodynamic temperature in Kelvin (K). At 25 °C. $\ln 10 \cdot R \cdot T F = 0.059157$ (V) Since the pH reference buffer solutions and pH standard buffer solution ionic strength can be considered the same species and, after selection by measuring the battery, Reduced the residual liquid junction potential small ($\leq 0.05\text{mV}$) enough. In this case, ΔE_j can be considered approximately equal to zero, then the pH standard buffer solution pH value (pH (S) II) formula can be simplified to formula (6). $\text{pH (S) II} = \text{pH (S) I} + F \cdot E \ln 10 \cdot R \cdot T$ (6)

5 Reagents and materials

5.1 General provisions Unless otherwise specified in this standard, the standard solution, preparations and products, according to GB/T 601, the provisions of the preparation of GB/T 603, laboratory Water should be consistent with GB/T 6682 in two water specifications. The use of high-purity hydrogen gas. The solution to both mass "%" represents fraction. Weigh 10.12g bake at $110\text{ °C} \pm 5\text{ °C}$ to constant of the sample, dissolved in water and diluted to 1000mL at $20\text{ °C} \pm 5\text{ °C}$ when. Weigh 3.387g at $115\text{ °C} \pm 5\text{ °C}$ drying to constant potassium dihydrogen phosphate and 3.533g at $115\text{ °C} \pm 5\text{ °C}$ drying to a constant amount of hydrogen phosphate Disodium was dissolved in water and diluted to 1000mL at $20\text{ °C} \pm 5\text{ °C}$ when. Weigh 3.80g (drier in excess of sodium chloride and sucrose crystals) in a saturated solution of sodium chloride and sucrose dryer and dried to constant Amount of sample, no carbon dioxide dissolved in water and diluted to 1000mL at $20\text{ °C} \pm 5\text{ °C}$ when. After the cork tightly to save two months to Three months. Same isotype pH reference buffer solutions and pH buffer standard solution preparation method.

6 Instruments

6.1 measuring cell Battery measuring apparatus shown in Figure 1. Measuring cell battery container, temperature and humidity control, platinum (palladium) hydrogen electrode, salt bridge components. 1 measuring cell device (hydrochlorothiazide has liquid junction cell)

6.1.1 battery container A battery container made of hard glass.

6.1.2 Humidity tube Humidity tube made of hard glass.