

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

HJ 962-2018

Soil - Determination of pH - Potentiometry

土壤 pH 值的测定 电位法

(English Translation)

Issued on: July 29, 2018

Implemented on: January 1, 2019

Issued by: Ministry of Ecology and Environment

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Foreword

To implement the "Environmental Protection Law of the People's Republic of China", protect the ecological environment, protect human health, and regulate soil pH the method of determination is to develop this standard.

This standard specifies the potential method for determining soil pH.

Appendix A of this standard is an informative annex.

This standard is the first release.

This standard is formulated by the Environmental Monitoring Department and the Science and Technology Standards Department.

This standard was drafted. Nanjing Institute of Environmental Sciences, Ministry of Environmental Protection, Jiangsu Environmental Monitoring Center.

This standard is verified by. Hunan Environmental Monitoring Center Station, Suzhou

Environmental Monitoring Center, Jiangsu Kangda Testing Technology Unit Co., Ltd., Su Li Environmental Technology Co., Ltd., Jiangsu Geological Survey Research Institute and Shanghai Real Testing Technology Service Limited.

This standard is approved by the Ministry of Ecology and Environment on July 29, 2018.

This standard has been implemented since January 1, 2019.

This standard is explained by the Ministry of Ecology and Environment.

1 Soil pH determination potential method

1 Scope of application this standard specifies the potential method for determining soil pH.

This standard applies to the determination of soil pH.

2 Normative references

This standard refers to the following documents or their terms. For undated references, the valid version applies to this standard.

HJ/T 166 Technical Specifications for Soil Environmental Monitoring

3 Principle of the method

Using water as the extractant, the water-soil ratio is 2.5.1, and the indicator electrode and the reference electrode (or pH composite electrode) are immersed in the soil suspension.

In the case of turbid liquid, a primary battery is formed. At a certain temperature, the electromotive force is related to the pH value of the suspension, and the original electricity is measured.

The electromotive force of the pool gives the pH of the soil.

4 Reagents and materials

Unless otherwise stated, analytically pure reagents that meet national standards were used for the analysis.

4.1

Experimental water. freshly prepared distilled water or pure water from which carbon dioxide is removed.

Water was poured into the flask, boiled for 10 min, and allowed to cool. Use the current system.

4.2

Potassium hydrogen phthalate ($\text{C}_8\text{H}_5\text{KO}_4$).

Dry for 2 h at $110^\circ\text{C} \sim 120^\circ\text{C}$ before use.

4.3

Potassium dihydrogen phosphate (KH_2PO_4).

Dry for 2 h at $110^\circ\text{C} \sim 120^\circ\text{C}$ before use.

4.4

Anhydrous disodium hydrogen phosphate (Na_2HPO_4).

Dry for 2 h at $110^\circ\text{C} \sim 120^\circ\text{C}$ before use.

4.5

Sodium tetraborate ($\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$).

Placed in a desiccator with saturated sodium bromide (or sodium chloride plus sucrose) solution (room temperature) for 48 h to make sodium tetraborate the crystal remains stable.

4.6

pH 4.01 (25°C) standard buffer solution. $c(\text{C}_8\text{H}_5\text{KO}_4) = 0.05 \text{ mol/L}$.

Weigh 10.12 g of potassium hydrogen phthalate (4.2), dissolve in water, and dilute to 1 L in a volumetric flask at 25°C . and also Standard solutions that meet national standards can be used directly.

4.7

pH 6.86 (25°C) standard buffer solution. $c(\text{KH}_2\text{PO}_4) = 0.025 \text{ mol/L}$, $c(\text{Na}_2\text{HPO}_4) = 0.025 \text{ mol/L}$.

3.387 g of potassium dihydrogen phosphate (4.3) and 3.533 g of anhydrous sodium hydrogen phosphate (4.4) were weighed and dissolved in water.

Dilute to 1 L in a volumetric flask at 225°C . Standard solutions that meet national standards can also be used directly.

4.8

pH 9.18 (25°C) standard buffer solution. $c(\text{Na}_2\text{B}_4\text{O}_7) = 0.01 \text{ mol/L}$.

Weigh 3.80 g of sodium tetraborate (4.5), dissolve in water, dilute to 1 L in a volumetric flask at 25°C , in a polyethylene bottle Sealed in the middle. Standard solutions that meet national standards can also be used directly.

Note: The above pH standard buffer solution can be stored in the refrigerator at 4°C for 2 to 3 months. When turbidity, mold or precipitation is found, can't continue to use.

5 Instruments and equipment

5.1

pH meter. Accuracy is 0.01 pH unit with temperature compensation.

5.2

Electrode. glass electrode and saturated calomel electrode, or pH composite electrode.

5.3

Magnetic stirrer or horizontal oscillator. with temperature control.

5.4

Soil Screen. Aperture 2 mm (10 mesh).

5.5

Common instruments and equipment used in general laboratories.

6.1 Sample collection and preservation

Soil samples were collected and stored in accordance with the relevant regulations of HJ/T 166.

6.2 Preparation of samples

Preparation of soil samples in accordance with HJ/T 166, including air drying, shrinkage, comminution and sieving of samples (5.4). When the prepared sample is not immediately measured, it should be sealed and stored to protect it from atmospheric ammonia and acid gases.

Avoid the effects of sun exposure, high temperature and humidity.

6.3 Preparation of samples

Weigh 10.0 g of soil sample into a 50 ml tall beaker or other suitable container and add 25 ml of water (4.1).

After sealing the container with a sealing film or plastic wrap, stir vigorously for 2 min with a magnetic stirrer (5.3) or with a horizontal shaker (5.3) Vibrate vigorously for 2 min. After standing for 30 min, the measurement was completed within 1 h.

7.1 Calibration

The pH meter is calibrated using at least two pH standard buffer solutions. First use pH 6.86 (25 ° C) standard buffer solution (4.7), then use standard buffer solution (4.6) of pH 4.01 (25 °C) or standard buffer solution of pH 9.18 (25 °C) (4.8) calibration. The calibration