

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

HJ 704-2014

**Soil quality-Determination of available phosphorus. Sodium
hydrogen carbonate solution MoSb antispectrophotometric
method**

土壤 有效磷的测定 碳酸氢钠浸提-钼锑抗分光光度法

(English Translation)

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Foreword

To implement the "People's Republic of China Environmental Protection Law", protecting the environment, safeguarding human health, regulate soil available phosphorus Measuring method, the development of this standard.

This standard specifies the determination of sodium bicarbonate leaching soil phosphorus - Molybdenum - Antimony Anti spectrophotometry.

This standard is the first release.

Appendix A of this standard is an informative annex.

This standard is developed by the Ministry of Environmental Protection Science, Technology organization.

Drafting of this standard. Nantong Municipal Environmental Monitoring Center.

The standard verification. Jiangsu Provincial Environmental Monitoring Center, Yangzhou Municipal Environmental Monitoring Center, Zhenjiang Municipal Environmental Monitoring Center Station, Nantong City Agricultural Products Quality Testing Center, Suzhou Municipal Environmental Monitoring Center Station and Nantong, Tongzhou District Environmental Monitoring Station.

This standard MEP September 15, 2014 for approval.

This standard shall be December 1, 2014 implementation.

The standard explanation by the Ministry of Environmental Protection.

Determination of sodium bicarbonate extraction of soil phosphorus - Molybdenum -

Antimony Anti spectrophotometry

1 Scope

This standard specifies the determination of sodium bicarbonate leaching soil phosphorus - Molybdenum - Antimony Anti spectrophotometry.

This standard applies to the determination of neutral and calcareous soil available phosphorus.

When the sample volume is 2.50 g, sodium bicarbonate solution using 50ml extraction, using 10 mm cuvette, the method detection limit of 0.5 mg/kg, detection limit of 2.0 mg/kg.

2 Normative references

This standard refers to the contents of the following documents or the terms. For undated references, the effective version suitable for this standard.

HJ/T 166 soil environmental monitoring technical specifications HJ 613 Determination of dry matter and soil moisture weight method NY/T 395-2012 farmland soil environmental quality monitoring technical specifications

3 Terms and Definitions

Soil phosphorus available phosphorous Abbreviated as AP, also known as available phosphorus, soil phosphorus in the plant during the growing season can be absorbed by plant roots, that is, in the present standard Under the conditions specified in the leaching out of the soil solution phosphorus, weakly adsorbed phosphorus, exchangeable phosphorus and soluble solid phosphate.

4 Principle of the method

With 0.5 mol/L sodium bicarbonate solution (pH = 8.5) leaching soil phosphorus. Extracts of phosphorus and molybdenum, antimony anti-color Agent to form phosphomolybdic blue, absorbance was measured at a wavelength of 880 nm at. Within a certain range of concentration, phosphorus content and absorbance in line with Lambert - Beer law.

5 and elimination of interference when extracts of arsenic concentrations greater than 2 mg/L interfere, it can remove sodium thiosulfate; sodium sulfide content of greater than 2 mg/L have Interference, nitrogen can be removed under acidic conditions; hexavalent chromium is greater than 50 mg/L of interference is removed with sodium sulfite; iron content to 20 mg/L, so that the results of the low 5%.

6 Reagents and materials

Unless otherwise indicated, the use of chemical analytical reagents meet the national standard analysis. Water was used to freshly prepared Ionized or distilled water.

6.1

sulfate. $\rho(\text{H}_2\text{SO}_4) = 1.84 \text{ g/ml}$.

Nitrate 6.2. $\rho(\text{HNO}_3) = 1.51 \text{ g/ml}$.

6.3

acetic acid. $\rho(\text{C}_2\text{H}_4\text{O}_2) = 1.049 \text{ g/ml}$.

6.4

potassium dihydrogen phosphate (KH_2PO_4). pure class distinctions.

Take appropriate amount of potassium dihydrogen phosphate in the weighing bottle, placed in 105°C drying 2h, cooling in the oven and set aside.

6.5

Sodium hydroxide solution. $\omega(\text{NaOH}) = 10\%$.

Weigh 10 g of sodium hydroxide dissolved in water and diluted with water to 100 ml, stored in polyethylene bottles.

6.6

sulfuric acid solution. $c(1/2 \text{ H}_2\text{SO}_4) = 2 \text{ mol/L}$.

In 800 ml of water, stirring constantly slowly added 55 ml of sulfuric acid (6.1), until the solution was cooled, add water to 1000 ml, Mix well.

6.7

the nitric acid solution. 1 + 5 (V/V).

Formulated with nitric acid (6.2).

6.8

Extraction agent. $c(\text{NaHCO}_3) = 0.5 \text{ mol/L}$.

Weigh 42.0 g sodium bicarbonate dissolved in about 800 ml of water, diluted with water to about 990 ml, with sodium hydroxide solution (6.5) Adjusted to $\text{pH} = 8.5$ (with a pH meter), add water to 1L, temperature controlled at $25 \pm 1^\circ\text{C}$. Store in a polyethylene bottle, the solution should be used within 4h.

Note 1: The extraction agent temperature should be controlled at $25 \pm 1^\circ\text{C}$. When a specific control, preferably with a small room in a thermostatic chamber, in addition to the winter temperature to maintain 25°C , but also Need to deionized water previously heated to $26 \sim 27^\circ\text{C}$ and then

formulated.

6.9

antimony potassium tartrate solution. $\rho(K(SbO)C_4H_4O_6 \cdot 1/2H_2O) = 5 \text{ g/L}$.

Weigh 0.5g antimony potassium tartrate was dissolved in 100 ml of water.

6.10 Molybdate solution

Measure 153ml of sulfuric acid (6.1) slowly into approximately 400 ml of water, stir well, cool. Another 10.0g paramolybdate was dissolved in 300ml of water to about 60 deg.] C, cooled. Then slowly poured sulfuric acid solution of ammonium molybdate solution, stir, then add 100 ml of tartar Antimony potassium acid solution (6.9), and finally water volume to 1L. The solution containing 10g/L ammonium molybdate and 2.75mol/L sulfuric acid. The solution it was stored in a brown bottle, stored for one year.

6.11 ascorbic acid solution. $\omega(C_6H_8O_6) = 10\%$.

Weigh 10 g of ascorbic acid dissolved in water, was added 0.2 g EDTA disodium edetate and 8 ml of glacial acetic acid (6.3), Add water to 100ml. The solution was stored in a brown reagent bottle, it is stable at 4 °C for 3 months. Such as the color yellow, then abandoned to reconfiguration.

6.12 P standard stock solution. $\rho(P) = 100 \text{ mg/L}$.

Weigh 0.4394g potassium dihydrogen phosphate (6.4) dissolved in about 200 ml of water, add 5ml of sulfuric acid (6.1), then moved to 1000ml Volumetric flask, add water, and mix. The solution was stored in a brown reagent bottle, valid for one year. Or purchase a commercially available direct Certified reference materials.

6.13 Phosphorus standard solution. $\rho(P) = 5.00 \text{ mg/L}$.

Amount of 5.00 ml of phosphorus stock standard solution (6.12) in 100 ml volumetric flask, dilute to the mark with the extraction agent (6.8).

Pro with the existing service.

6.14 Indicator. 2,4-dinitrophenol or 2,6-dinitrophenol ($C_6H_4N_2O_5$), $\omega = 0.2\%$.

Weigh 0.2g 2,4- dinitrophenol or 2,6-dinitrophenol is dissolved in 100 ml of water, the solution was stored in a glass bottle.

7 Instruments and equipment

Experiment glassware must first washed with phosphate-free detergent, then nitric acid solution (6.7) soaked 24h, before re-use by Times with tap water and washed with deionized water.