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

HJ 632-2011

**Soil. Determination of Total Phosphorus by alkali fusion. Mo-Sb
Anti spectrophotometric method**

土壤 总磷的测定 碱熔-钼锑抗分光光度法

(English Translation)

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Foreword

In order to implement the "Environmental Protection Law of the People's Republic of China", protect the environment, protect human health, and regulate the measurement of total phosphorus in the soil.

Determine the method and formulate this standard.

This standard specifies the alkali fusion-molybdenum anti-spectrophotometry for the determination of total phosphorus in soil.

This standard is the first release.

This standard was formulated by the Science and Technology Standards Department of the Ministry of Environmental Protection.

This standard is mainly drafted by. Gansu Provincial Environmental Monitoring Center Station.

This standard is verified by. Henan Environmental Monitoring Center Station, Qinghai Environmental Monitoring Center Station, Lanzhou Environmental Monitoring Station, Jinchang Environmental Monitoring Station and Lanzhou Petrochemical Company Monitoring Station.

This standard was approved by the Ministry of Environmental Protection on December 6, 2011.

This standard has been implemented since March 1, 2012.

This standard is explained by the Ministry of Environmental Protection.

Determination of total phosphorus in soil - alkali fusion-molybdenum antimony anti-spectrophotometric method

1 Scope of application

This standard specifies the alkali fusion-molybdenum anti-spectrophotometry for the determination of total phosphorus in soil.

This standard applies to the determination of total phosphorus in soil.

When the sample amount is 0.2500g and the 30mm cuvette is used, the detection limit of the method is 10.0mg/kg, and the lower limit of determination is 40.0 mg/kg.

2 Normative references

The contents of this standard refer to the following documents or their terms. For undated references, the valid version is appropriate.

Used in this standard.

HJ 613 Determination of dry matter and moisture in soils - Gravimetric method HJ/T 166 Technical Specifications for Soil Environmental Monitoring

3 Principle of the method

Melted by sodium hydroxide, the phosphorus-containing minerals and organophosphorus compounds in the soil samples are all converted into soluble orthophosphoric acid.

The salt is reacted with a molybdenum anti-chromogen to form a phosphorus molybdenum blue under acidic conditions, and the absorbance is measured at a wavelength of 700 nm. In a certain thick Within the range of degrees, the total phosphorus content and absorbance values in the sample are in accordance with Lambert-Beer's law.

4 Reagents and materials

Analytical purification reagents that meet national standards were used for analysis unless otherwise stated. Experimental water is freshly prepared Ionic water or distilled water, conductivity (25 ° C) $\leq 5.0 \mu\text{S}/\text{cm}$.

4.1

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

4.2

Sodium hydroxide. granular, excellent grade.

4.3

Anhydrous ethanol. $\rho(\text{CH}_3\text{CH}_2\text{OH}) = 0.789 \text{ g}/\text{ml}$.

4.4

Concentrated nitric acid. $\rho(\text{HNO}_3) = 1.51 \text{ g}/\text{ml}$.

4.5 Potassium dihydrogen phosphate. excellent grade pure

Take appropriate amount of potassium dihydrogen phosphate (KH_2PO_4) in a weighing bottle, dry at 110 ° C for 2 h, place in a desiccator to cool, prepare use.

4.6 Sulfuric acid solution. $c(\text{H}_2\text{SO}_4)=3\text{mol/L}$

In 800 ml of water, slowly add 168 ml of concentrated sulfuric acid (4.1) with constant stirring. After the solution is cooled, add water to 1000.

MI, mix.

4.7 Sulfuric acid solution. $c(\text{H}_2\text{SO}_4)=0.5\text{mol/L}$

In 800 ml of water, slowly add 28 ml of concentrated sulfuric acid (4.1) with constant stirring. After the solution is cooled, add water to 1000 ml.

Mix well.

4.8 Sulfuric acid solution. 1+1

Formulated with concentrated sulfuric acid (4.1).

4.9 Sodium hydroxide solution. $c(\text{NaOH}) = 2\text{mol/L}$

Weigh 20.0 g of sodium hydroxide (4.2), dissolve in 200 ml of water, add water to 250 ml after the solution is cooled, and mix.

4.10 Ascorbic acid solution. $\rho=0.1\text{ g/ml}$

Weigh 10.0g of ascorbic acid dissolved in an appropriate amount of water, add water to 100ml after dissolution, and mix. The solution is stored in brown glass the bottle is stable for about two weeks at about 4 °C. If the color turns yellow, discard the re-match.

4.11 Ammonium molybdate solution. $\rho[(\text{NH}_4)_6\text{Mo}_7\text{O}_{24}\cdot 4\text{H}_2\text{O}]=0.13\text{ g/ml}$

Weigh 13.0 g of ammonium molybdate dissolved in an appropriate amount of water, dissolve and add water to 100 ml, and mix.

4.12 Potassium bismuth tartrate solution. $\rho[\text{K}(\text{SbO})\text{C}_4\text{H}_4\text{O}_6\cdot 1/2\text{H}_2\text{O}]=0.0035\text{ g/ml}$

Weigh 0.35 g of bismuth potassium tartrate dissolved in an appropriate amount of water, dissolve and add water to 100 ml, and mix.

4.13 Molybdate solution

100 ml of ammonium molybdate solution (4.11) was slowly added to the cooled 300 ml sulfuric acid solution (4.8) with constant stirring.

In addition, add 100ml of potassium bismuth tartrate solution (4.12) and mix. The solution was stored in a brown glass bottle at 4 ° C can be stable for two months.