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

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**Soil. Determination of ammonium, nitrite and nitrate by
extraction with potassium chloride solution-spectrophotometric
methods**

(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 ammonia nitrogen in the soil.

This standard is formulated for the determination of nitrite nitrogen and nitrate nitrogen.

This standard specifies the potassium chloride solution extraction-spectrophotometry for the determination of ammonia nitrogen, nitrite nitrogen and nitrate nitrogen in soil.

The technical content of this standard is to modify the use of soil quality nitrate nitrogen, nitrite nitrogen, ammonia nitrogen determination of potassium chloride Solution Extraction Method (ISO/T S 14256-1.2003 (E)). Appendix A gives this standard and ISO/T S 14256-1.2003(E) the chapter number comparison checklist, Appendix B gives the technical differences between this standard and ISO/T S 14256-1.2003 (E) and the reason.

This standard is the first release.

Appendix A to Appendix C of this standard are informative annexes.

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

This standard is mainly drafted by. Anshan Environmental Monitoring Center Station.

This standard was approved by the Ministry of Environmental Protection on February 29, 2012.

This standard has been implemented since June 1, 2012.

This standard is explained by the Ministry of Environmental Protection.

Determination of ammonia nitrogen, nitrite nitrogen and nitrate nitrogen in soil Potassium chloride solution extraction - spectrophotometry

1 Scope of application

This standard specifies the potassium chloride solution extraction-spectrophotometry for the determination of ammonia nitrogen, nitrite nitrogen and nitrate nitrogen in soil.

This standard applies to the determination of ammonia nitrogen, nitrite nitrogen and nitrate nitrogen in soil.

When the sample amount is 40.0 g, the detection limits of ammonia nitrogen, nitrite nitrogen and nitrate nitrogen in the soil by the method are respectively 0.10 mg/kg, 0.15 mg/kg, 0.25 mg/kg, the lower limit of determination was 0.40 mg/kg, 0.60 mg/kg, and 1.00 mg/kg, respectively.

2 Normative references

The contents of this standard refer to the terms in the following documents. For undated references, the valid version applies to this standard HJ 168 Environmental Monitoring Analytical Methods Standard Revision Technical Guidelines HJ 613 Soil Determination of dry matter and moisture Gravimetric method HJ/T 166 Technical Specifications for Soil Environmental Monitoring ISO/T S14256-1 Soil quality Determination of nitrate nitrogen, nitrite nitrogen, ammonia nitrogen Extraction of potassium chloride solution Soil quality-Determination of nitrate, nitrite and ammonium in field-moist soils by extraction with potassium chloride solution)

3.1 Ammonia nitrogen

The potassium chloride solution extracts ammonia nitrogen from the soil. Under alkaline conditions, the ammonia ions in the extract are stored with hypochlorite ions.

It reacts with phenol to form a blue indophenol dye with maximum absorption at 630 nm. Ammonia in a certain concentration range the nitrogen concentration and absorbance values are in accordance with Lambert-Beer's law.

3.2 Nitrite nitrogen

The nitrite nitrogen in the soil is extracted by potassium chloride solution. Under acidic conditions, the nitrite nitrogen in the extract is opposite to the sulfonamide.

A diazonium salt should be formed and coupled with N-(1-naphthyl)-ethylenediamine hydrochloride to form a red dye with a wavelength of 543 nm.

Maximum absorption. The nitrite nitrogen concentration and absorbance values are in accordance with Lambert-Beer's law over a range of concentrations.

3.3 Nitrate nitrogen

Nitrate nitrogen and nitrite nitrogen in soil are extracted by potassium chloride solution, and the extract is passed through a reduction column to reduce nitrate nitrogen.

For nitrite nitrogen, under acidic conditions, nitrite nitrogen reacts with sulfonamide to form diazonium salt, and then with N-(1-naphthyl) hydrochloride - Ethylenediamine is coupled to form a red dye with maximum absorption at a wavelength of 543 nm. Determination of nitrate nitrogen and nitrite nitrogen total the amount. The difference between the total amount of nitrate nitrogen and nitrite nitrogen and the nitrite nitrogen content is the nitrate nitrogen content.

4 Reagents and materials

Analytically pure reagents that meet national standards are used for analysis, unless otherwise noted. The experimental water use conductivity is less than 0.2.

Deionized water at mS/m (measured at 25 ° C).

4.1 Ammonia nitrogen

4.1.1

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

4.1.2

Sodium citrate dihydrate ($\text{C}_6\text{H}_5\text{Na}_3\text{O}_7 \cdot 2\text{H}_2\text{O}$).

4.1.3

Sodium hydroxide (NaOH).

4.1.4

Sodium dichloroisocyanurate ($\text{C}_3\text{Cl}_2\text{N}_3\text{NaO}_3 \cdot \text{H}_2\text{O}$).

4.1.5

Potassium chloride (KCl). excellent grade pure.

4.1.6 Ammonium chloride (NH_4Cl). excellent grade pure

Dry at 105 °C for 2 h.

4.1.7 Potassium chloride solution. $c(\text{KCl})=1 \text{ mol/L}$

Weigh 74.55 g of potassium chloride (4.1.5), dissolve it with an appropriate amount of water, transfer it to a 1000 ml volumetric flask, dilute to volume with water, and mix.

4.1.8 Ammonium chloride standard stock solution. $\rho(\text{NH}_4\text{Cl})=200 \text{ mg/L}$

Weigh 0.764 g of ammonium chloride (4.1.6), dissolve it with an appropriate amount of water, add 0.30 ml of concentrated sulfuric acid (4.1.1), and after cooling, Transfer to a 1000 ml volumetric flask, bring up to volume with water, and mix. The solution can be stored for one month at 4 ° C in the dark. Or direct purchase Buy a commercially available certified standard solution.

4.1.9 Standard use solution of ammonium chloride. $\rho(\text{NH}_4\text{Cl})=10.0 \text{ mg/L}$

Measure 5.0 ml of ammonium chloride standard stock solution (4.1.8) in a 100 ml volumetric flask, dilute to volume with water, and mix. Time is now Match.