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

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**Soil. Determination of cyanide and total cyanide. Spectrometric
method**

土壤 氰化物和总氰化物的测定 分光光度法

(English Translation)

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Foreword

To implement the "People's Republic of China Environmental Protection Law" to protect the environment, protect the safety and health of the human body, regulate soil cyanide and Determination of total cyanide, the development of this standard.

This standard specifies the spectrophotometric method for the determination of cyanide and total cyanide in soil.

This standard is the first release.

Appendix A to this standard is an informative appendix.

This standard is organized by the Ministry of Environmental Protection Science and Technology Standards Division.

The main drafting unit of this standard. Shanghai Environmental Monitoring Center.

The standard verification unit. Jiangsu Province Environmental Monitoring Center, Nanjing Environmental Monitoring Center Station, Suzhou City Environmental Monitoring Center Station, on Pudong New Area Environmental Monitoring Station, Shanghai Putuo District Environmental Monitoring Station, Shanghai Textile Energy Conservation and Environmental Protection Center.

This standard is approved by the Ministry of Environmental Protection on June 4, 2015.

This standard has been implemented since July 1, 2015.

This standard is explained by the Ministry of Environmental Protection.

Determination of soil cyanide and total cyanide - Spectrophotometric method Warning. Hydrocyanic acid and cyanide are highly toxic substances. In acidic solutions, highly toxic hydrocyanic acid gas (with pungent almonds) Taste) will be volatile out. Therefore, the sample should not be acidified unless the experiment is carried out at a specific step. The entire experimental process should be ventilated the laboratory personnel in the treatment of contaminated samples should be put on the appropriate gas masks.

1 Scope of application

This standard specifies the spectrophotometric method for the determination of cyanide and total cyanide in soil.

This standard is applicable to the determination of cyanide and total cyanide in soil.

When the sample amount is 10 g, the detection limit of isonicotinic acid-barbituric acid spectrophotometry is 0.01 mg/kg and the lower limit of determination is 0.04 Mg/kg; isonicotinic acid - pyrazolone spectrophotometric detection limit of 0.04 mg/kg, the determination of the lower limit of 0.16 mg/kg.

2 Normative reference documents

The contents of this standard refer to the following documents or their terms. For those who do not specify a date, the valid version applies to this standard.

Determination of water quality cyanide and its spectrophotometric method Determination of Dry Matter and Moisture in Soil Technical specification for soil environmental monitoring

3 Terms and definitions

The following terms and definitions apply to this standard.

Cyanide

Refers to cyanide in the presence of zinc nitrate in the presence of zinc nitrate in the presence of zinc nitrate, including all simple cyanide (Mostly alkali metal and alkaline earth metal cyanide) and zinc cyanide complex, does not include ferricyanide, ferrocyanide, copper cyanide complex, Nickel cyanide complex and cobalt cyanide complex.

Total cyanide

Refers to cyanide in the presence of divalent tin and divalent copper in the presence of pH 4 principle of the method

4.1 Isonicotinic acid - barbituric acid spectrophotometric method

The cyanide ions in the sample react with chloramine T under weakly acidic conditions to form cyanogen chloride, then react with isonicotinic acid, Into glutaraldehyde, and finally with barbituric acid reaction to produce purple blue compounds, the material at 600 nm wavelength at the maximum absorption.

4.2 Isonicotinic acid - pyrazolone spectrophotometric method

The cyanide ions in the sample react with chloramine T under neutral conditions to form cyanogen chloride and then react with isonicotinic acid to form Pentenaldehyde, and finally reacted with pyrazolone to form a blue dye, the material at 638 nm wavelength at the maximum absorption.

5 Interference and elimination

When the sample particles can not be uniformly dispersed in water, but accumulate on the reagent-air surface or reagent-glass wall interface , Will lead to reduced accuracy and precision, can be added before the distillation of 5 ml of ethanol to eliminate the impact.

Sulfide in the sample will interfere with the determination, the addition of copper sulfate during distillation can inhibit the interference of sulfide.

When the content of phenol in the sample is less than 500 mg/L, the determination of cyanide is not affected.

Grease interference can be added before the color of sodium dodecyl sulfate to be eliminated.

6 Reagents and materials

Unless otherwise stated, analytical reagents conforming to national standards are used in the analysis, and the test water is a freshly prepared distilled water or Ion water.

6.1

tartaric acid solution. $\rho(\text{C}_4\text{H}_6\text{O}_6) = 150 \text{ g/L}$.

Weigh 15.0 g of tartaric acid dissolved in water, diluted to 100 ml, shake.

6.2

zinc nitrate solution. $\rho[\text{Zn}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}] = 100 \text{ g/L}$.

Weigh 10.0 g of zinc nitrate dissolved in water, diluted to 100 ml, shake.

6.3

Phosphoric acid. $\rho(\text{H}_3\text{PO}_4) = 1.69 \text{ g/ml}$.

6.4

Hydrochloric acid. $\rho(\text{HCl}) = 1.19 \text{ g/ml}$.

6.5

hydrochloric acid solution. $c(\text{HCl}) = 1 \text{ mol/L}$.

Measure 83 ml of hydrochloric acid (6.4) slowly into the water, let cool down to 1000 ml.

6.6

Stannous chloride solution. $\rho(\text{SnCl}_2 \cdot 2\text{H}_2\text{O}) = 50 \text{ g/L}$.

Weigh 5.0 g of stannous chloride dihydrate in 40 ml hydrochloric acid solution (6.5), diluted with water to 100 ml, with the current allocation.

6.7

copper sulfate solution. $\rho(\text{CuSO}_4 \cdot 5\text{H}_2\text{O}) = 200 \text{ g/L}$.

Weigh 200 g of copper sulfate pentahydrate dissolved in water, diluted to 1000 ml, shake.

6.8

Sodium hydroxide solution. $\rho(\text{NaOH}) = 100 \text{ g/L}$.

Weigh 100 g of sodium hydroxide dissolved in water, diluted to 1000 ml, shake, stored in polyethylene containers.

6.9

Sodium hydroxide solution. $\rho(\text{NaOH}) = 10 \text{ g/L}$.

Weigh 10.0 g of sodium hydroxide dissolved in water, diluted to 1000 ml, shake, stored in polyethylene containers.

6.10

Sodium hydroxide solution. $\rho(\text{NaOH}) = 15 \text{ g/L}$.

Weigh 15.0 g of sodium hydroxide dissolved in water, diluted to 1000 ml, shake, stored in polyethylene containers.

6.11

Chloramine T solution. $\rho(\text{C}_7\text{H}_7\text{ClNNaO}_2\text{S} \cdot 3\text{H}_2\text{O}) = 10 \text{ g/L}$.

Weigh 1.0 g of chloramine T dissolved in water, diluted to 100 ml, shake, stored in brown bottles, with the current allocation.