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PEOPLE'S REPUBLIC OF CHINA**

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**Soil. Determination of water-soluble and acid-soluble sulfate.
Gravimetric method
(English Translation)**

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Foreword

To implement the "Environmental Protection Law of the People's Republic of China", protect the environment, protect human health, and regulate water solubility in soil this standard is established for the determination of acid-soluble sulfates.

This standard specifies the gravimetric method for determining water soluble and acid soluble sulfates in soil.

The technical content of this standard is to modify the method for determination of water-soluble and acid-soluble sulfate in soil quality.

(ISO 11048-1995). Appendix A gives a list of the comparison of this standard with the ISO 11048-1995 chapter number, Appendix B the technical differences between this standard and ISO 11048-1995 and their reasons are given.

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.

Soil water-soluble and acid-soluble sulfates Warning. Contaminated soil samples will produce toxic gases during acidification and heating, and the sample should be ventilated during operation.

Carry out in the cabinet and take appropriate protective measures.

1 Scope of application

This standard specifies the gravimetric method for determining water soluble and acid soluble sulfates in soil.

This standard applies to the determination of water-soluble and acid-soluble sulfate in air-dried soil.

The water-soluble sulfate is determined. When the sample amount is 10.0 g and extracted with 50 ml of water, the detection limit of the method is 50.0.

Mg/kg, the measurement range is $200 \sim 5.00 \times 10^3$ mg/kg; when the sample volume is 50.0 g, it is extracted with 100 ml water.

The detection limit of the method is 20.0 mg/kg, and the measurement range is $80.0 \sim 1.00 \times 10^3$ mg/kg. Determination of acid-soluble sulfate, when the amount of sample for 2.0 g, the detection limit of this method is 500 mg/kg, and the measurement range is $2.00 \times 10^3 \sim 2.50 \times 10^4$ mg/kg.

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 Technical Guidelines for Standardization and Revision of Environmental Monitoring and Analysis Methods
HJ/T 166 Technical Specifications for Soil Environmental Monitoring
ISO 11048 Soil quality - Determination of water-soluble and acid-soluble sulphates (Soil quality-Determination of water-soluble and acid-soluble sulfate)

3 Terms and definitions

The following terms and definitions apply to this standard.

3.1 Water-soluble sulfate

It means that the soil can be extracted by deionized water of 1.2 and 1.5 (soil-to-water ratio m/V) under the conditions stipulated in this standard.

Take the sulfate.

3.2 Acid-soluble sulfate acid-soluble sulfate

It refers to 6 mol/L dilute hydrochloric acid which can be 1.50 (diluted hydrochloric acid ratio m/V) in the soil under the conditions specified in this standard.

The extracted sulfate.

4 Principle of the method

The sulfate in the soil is extracted with deionized water or dilute hydrochloric acid, and the extract is filtered through a slow quantitative filter paper, and then cerium chloride is added.

The solution, the sulfate ion in the extract is converted to barium sulfate precipitate. The precipitate is filtered, dried, and constant weight.

The mass of the lake is used to calculate the content of water soluble and acid soluble sulfate in the soil.

5 Interference and elimination

5.1

When the concentration of nitrate, phosphate and silica in the extract is greater than 100 mg/L, 10 mg/L and 2.5 mg/L, respectively Positive interference; chromate, ferric ion and calcium ion concentrations greater than 10 mg/L, 50 mg/L and 100 mg/L, respectively Negative interference occurs. Interference can be eliminated by appropriately diluting the extract so that the concentration of the interferent is below the controlled concentration.

5.2

Sulfide in the sample will cause positive interference with the determination of acid soluble sulfate. Elimination method. take 20 ml hydrochloric acid solution (6.9) Heat to boiling in a 500 ml beaker. Stop heating and add 2 g of prepared soil sample with stirring.

Continue the acid extraction operation.

5.3

The organic content in the extract is too high (ie, the permanganate index >30 mg/L) may be due to the adsorption of coprecipitation and interference measurement. Elimination method. Move a certain volume of the sample to the platinum evaporating dish and add 2 drops of methyl orange solution (6.12).

Neutralize to pH 5~8 with hydrochloric acid solution (6.9) or sodium hydroxide solution (6.11), then add 2.0 ml hydrochloric acid solution (6.9).

The evaporating dish was placed in a water bath and evaporated to near dryness, then 5 drops of sodium chloride solution (6.8) were added and evaporated to dryness. Move the evaporating dish to the muffle in the furnace, heat at 700 ° C for 15 min until the evaporating dish is completely red hot and the inner melt is ash. Cool the evaporating dish and use 10 ml Water wet ash, add 5 drops of hydrochloric acid solution (6.9), put it in boiling water bath and evaporate slowly, then slowly cool, then add 10 ml After the water was all transferred to a 500 ml beaker, to be tested.