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

HJ 1082-2019

**Soil and sediment--Determination of Cr(VI)--Alkaline digestion/
flame atomic absorption spectrometry**

土壤和沉积物 六价铬的测定 碱溶液提取-火焰原子吸收分光光度法

(English Translation)

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Foreword

In order to implement the "Environmental Protection Law of the People's Republic of China" Environment, protect human health, standardize the determination method of hexavalent chromium in soil and sediment, and formulate this standard.

This standard specifies the alkaline solution extraction-flame atomic absorption spectrophotometry for determination of hexavalent chromium in soil and sediment.

This standard is issued for the first time.

This standard is formulated by the Department of Eco-Environmental Monitoring, Laws and Standards Department of the Ministry of Ecology and Environment.

This standard was drafted. Shanghai Environmental Monitoring Center.

This standard is verified by. Tianjin Eco-environment Monitoring Center, the Fifth Institute of Electronics of the Ministry of Industry and Information Technology, Shanghai Environmental Science Research Institute, Shanghai Instrument & Electronics Industry Environmental Monitoring Station, Shanghai Chemical Environmental Protection Monitoring Station and Shanghai Xu Environmental monitoring station in the District.

This standard was approved by the Ministry of Ecology and Environment on December 31, 2019.

This standard will be implemented from June 30, 2020.

This standard is explained by the Ministry of Ecology and Environment.

Determination of hexavalent chromium in soils and sediments. Alkali solution extraction-flame atomic absorption Spectrophotometry

1 Scope

This standard specifies the alkaline solution extraction-flame atomic absorption spectrophotometry for determination of hexavalent chromium in soil and sediment.

This standard applies to the determination of hexavalent chromium in soil and sediment.

When the sample volume of soil and sediment is 5.0 g and the constant volume is 100 ml, the method of hexavalent chromium determined by this standard is checked.

The limit of detection was 0.5 mg/kg, and the lower limit of determination was 2.0 mg/kg.

2 Normative references

This standard refers to the following documents or clauses therein. For undated references, the valid version applies to this standard.

GB 17378.3 Marine Monitoring Code Part 3. Sample Collection, Storage and Transportation
GB 17378.5 Marine Monitoring Code Part 5. Sediment Analysis HJ 25.2 Technical Guidelines for Soil Pollution Risk Management and Remediation Monitoring on Construction Land HJ 494 Water Quality Sampling Technical Guide HJ 495 Water Quality Sampling Scheme Design Technical Regulations HJ 613 Soil dry matter and moisture determination by gravimetric method HJ/T 91 Technical specifications for surface water and sewage monitoring HJ/T 166 Technical Specifications for Soil Environmental Monitoring

3 Method principle

Use an alkaline extraction solution with a pH of not less than 11.5 to extract the hexavalent chromium in the sample and spray it into an air-acetylene flame.

The ground-state atoms of chromium formed in the warm flame absorb the characteristic spectral lines of chromium.

Is proportional to the mass concentration.

4 Interference and cancellation

In alkaline environment (pH $\geq$ 11.5), the sample is inhibited by magnesium chloride and dipotassium hydrogen phosphate-potassium dihydrogen phosphate buffer solution.

The presence of trivalent chromium does not interfere with the determination of hexavalent

chromium.

5 Reagents and materials

Unless otherwise specified, analytical reagents that meet national standards are used in the analysis, and the experimental water is newly prepared deionized water.

water.

5.1

Nitric acid. $\rho(\text{HNO}_3) = 1.42 \text{ g/ml}$, excellent purity.

5.2

Sodium carbonate (Na_2CO_3).

5.3

Sodium hydroxide (NaOH).

5.4

Magnesium chloride (MgCl_2).

5.5

Dipotassium hydrogen phosphate (K_2HPO_4).

5.6

Potassium dihydrogen phosphate (KH_2PO_4).

5.7

Dipotassium phosphate-potassium dihydrogen phosphate buffer solution. $\text{pH} = 7$.

Weigh 87.1 g of potassium dihydrogen phosphate (5.5) and 68.0 g of potassium dihydrogen phosphate (5.6) in water and dilute to volume.

5.8

Alkaline extraction solution.

Weigh 30 g of sodium carbonate (5.2) and 20 g of sodium hydroxide (5.3) in water, dilute to volume to 1 L, and store in dense Sealed in a polyethylene bottle. Before use, the pH must be greater than 11.5.

5.9

Potassium dichromate ($\text{K}_2\text{Cr}_2\text{O}_7$). reference reagent.

Weigh 5.0 g of potassium dichromate in a porcelain crucible, bake in a drying oven at 105°C for 2 h, cool to room temperature, and store in a desiccator Inside, spare.

5.10

Hexavalent chromium standard stock solution. $\rho = 1000 \text{ mg/L}$.

Accurately weigh 2.829 g (accurate to 0.1 mg) of potassium dichromate (5.9) in water and dilute to volume to 1 L. also may Directly purchase a commercially available certified reference material or certified reference solution.

5.11

Hexavalent chromium standard use solution. $\rho = 100 \text{ mg/L}$.

Accurately transfer 10.0 ml of hexavalent chromium standard stock solution (5.10) into a 100 ml volumetric flask, and make up to the mark with water.

Shake well. Store at room temperature for 6 months.

5.12

Filter. $0.45 \mu\text{m}$.

5.13

Polyethylene film.

6 Instruments and equipment

6.1

Flame atomic absorption spectrophotometer.

6.2

Chrome hollow cathode lamp or other light source.

6.3

Stirring and heating device. It has magnetic heating stirrer and temperature control device, which can heat up to 100°C .

6.4

Vacuum filtration device.

6.5

pH meter. The accuracy is 0.1 pH unit.

6.6

Balance. Sensitivity is 0.1 mg.

6.7

Nylon screen. 0.15 mm (100 mesh).