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

DZ/T 0253.2-2014

**Analytic methods for biologic samples in eco-geochemistry
assessment. Part 2: Determination of selenium content.
Fluorescent spectrophotometry**

生态地球化学评价动植物样品分析方法 第2部分：硒量的测定 原子荧光光谱法 清
晰版

(English Translation)

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Foreword

--- Part 1. Determination of the amount of 19 elements of lithium, boron, bismuth, etc. by inductively coupled plasma mass spectrometry (ICP-MS);

--- Part 2. Determination of selenium content by atomic fluorescence spectrometry;

---Part 3. Determination of total mercury - Cold atomic fluorescence spectrometry;

--- Part 4. Determination of the amount of fluorine - Spectrophotometric method.

This part is the second part of DZ/T 0253.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This part is proposed by the Ministry of Land and Resources of the People's Republic of China.

This part is under the jurisdiction of the National Land Resources Standardization Technical Committee.

This section drafted by. National Geological Experimental Testing Center.

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Introduction

The analysis of eco-geochemical survey and evaluation samples is carried out with the gradual development and deepening of multi-target geochemical survey work.

An analytical work aimed at the assessment of the results of multi-target geochemistry or other regional geochemical surveys.

The system includes river ecosystems, farmland ecosystems, urban ecosystems, shallow

sea ecosystems, and grassland ecosystems for evaluation.

In the evaluation stage of the eco-geochemical survey, based on the results of the soil circle survey, further recourse to elements in the lithosphere, soil circle, hydrosphere Selecting typical and representative regions for migration and transformation in the biosphere, and selecting multi-media sampling and selectivity indicators Component analysis and activity state analysis, biology (including animals and plants) is one of the main work objects of this stage of analysis and testing.

The elements that make up the organism come from the geological environment, and the organism exchanges substances with the environment continuously. This exchange involves solid phase (lithosphere) and liquid.

The phase (hydrosphere) and the gas phase (atmosphere) eventually tend to be a dynamic equilibrium. Geochemical elements from the surface of the earth's crust, weathered by the parent rock it is released into the soil and then activated into an effective state to be absorbed by the plant. The elements that enter the plant will inevitably affect its growth and development.

Sound, thus affecting the yield and quality of the plant, and then entering the animal and the human body through the food chain, and also the growth and health of the animal and the human body.

Important impact on life. Therefore, ecological geochemical evaluation will ultimately use biological sample analysis to illustrate the problem.

Ecological geochemical evaluation method for animal and plant samples Part 2.

Determination of selenium content Atomic fluorescence spectrometry Cautions - Personnel using this section should have hands-on experience in formal laboratory work. This section does not point out all possible security questions.

question. It is the responsibility of the user to take appropriate safety and health measures and to ensure compliance with the conditions set by the relevant national regulations.

1 Scope

This part of DZ/T 0253 specifies the method of atomic fluorescence spectrometry for the determination of selenium in animal and plant samples by eco-geochemical evaluation.

This section applies to the determination of the amount of selenium in the animal and plant samples by eco-geochemical evaluation by atomic fluorescence spectrometry.

The method detection limit was 0.007 µg/g.

Selenium is measured in the range of 0.02 µg/g to 10 µg/g.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the dated version applies to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 6379.2 Accuracy of measurement methods and results (accuracy and precision) Part 2. Determination of standard method of measurement Basic method of sex and reproducibility GB/T 6379.4 Accuracy of measurement methods and results (accuracy and precision) Part 4. Determining the standard measurement method correctly Basic method of degree DZ/T 0253.1-2014 Eco-geochemical evaluation method for the analysis of animal and plant samples - Part 1 . 19 elements of lithium, boron, vanadium Inductively Coupled Plasma Mass Spectrometry (ICP-MS)

3 Principle

The sample was digested with high temperature and high pressure in a special microwave digestion apparatus with nitric acid and hydrogen peroxide. The sample was sampled in a 6 mol/L hydrochloric acid medium.

Reduction of hexavalent selenium to tetravalent selenium, using sodium borohydride (NaBH_4) or potassium borohydride (KBH_4) as a reducing agent, and divalent selenium in a hydrochloric acid medium the original hydrogen selenide (H_2Se) is carried by the carrier gas (argon) into the atomizer for atomization. Under the illumination of the selenium hollow cathode lamp, the ground state selenium atom is Excited to a high energy state, when deactivated back to the ground state, a characteristic wavelength of fluorescence is emitted, and the fluorescence intensity is proportional to the selenium content. And standard department Columns are compared quantitatively.

4 Reagents

Unless otherwise stated in this section, superior grade pure reagents and distilled water or equivalent purity water in accordance with national standards are used in the analysis. main Reagents include.

4.1

Nitric acid ($\rho = 1.42 \text{ g/mL}$).

4.2

Hydrogen peroxide [$w(\text{H}_2\text{O}_2) = 30\%$].

4.3

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