

Atomic Fluorescence Spectrum Method to Determine the Precautions of Mercury and Arsenic

Xubo Sun^{1,2,3,4}, Zhao Wang^{1,2,3,4}

¹ Shaanxi Provincial Land Engineering Construction Group Co., Ltd., China

² Institute of Land Engineering and Technology, Shaanxi Provincial Land Engineering Construction Group Co., Ltd., China

³ Key Laboratory of Degraded and Unused Land Consolidation Engineering, the Ministry of Natural Resources, China

⁴ Land Engineering Quality Testing of Shaanxi Land Engineering Construction Group Co., Ltd., China

Abstract

The fluorescent characteristics of arsenic and mercury determine that the atomic fluorescence method can be used to determine its content in the natural environment of the atmosphere, soil, and water body to effectively understand the arsenic and mercury pollution in the natural environment. Essence According to this experimental analysis, it can be seen that the application of the atomic fluorescence method is better, which can meet the needs of arsenic and mercury analysis in different situations in different situations. Compared with previous measurement methods, the atomic fluorescence method has high accuracy, high recovery rate, accurate accuracy, accurate accuracy High rates, small pollution, fast detection speed and other advantages. However, it is worth noting that during the test, the sample selection and processing work, and the exclusion of factors should be done to improve the measurement effect.

Keywords

Arsenic; Mercury Element; Environmental Monitoring; Atomic Fluorescence Method.

1. Introduction

The effect of atomic fluorescence on the analysis of arsenic and elemental mercury in environmental monitoring. As a part of environmental monitoring, the experimental analysis of atmosphere, soil, and water column showed that the atomic fluorescence method has good application effects in the analysis of atmosphere, soil, arsenic, and water column mercury analysis, high accuracy, and fast detection speed. With the acceleration of economic development and social construction, the construction and development of some industries have a serious impact on the natural environment, causing pollution problems such as air, soil, and water. It is serious to pose a serious threat to the survival and development of humans, animals and plants. This requires strengthening environmental monitoring, timely obtaining comprehensive, accurate and reliable data on environmental pollution, and controlled scientific, effective and reasonable measures to control the impact of environmental pollution. The increase in arsenic and mercury content is a common phenomenon of environmental pollution. These problems should be paid special attention to in environmental monitoring. The atomic fluorescent spectrometer is a precision instrument that measures the element of measuring traces. It should be strictly operated in accordance with the requirements of the instrument manual, and carefully maintain it regularly. Usage life, maintain the high sensitivity of the instrument to ensure the accuracy of the analysis results. The solution of the working principle

to be measured is mixed with sodium (potassium) (potassium). Under acidic conditions, arsenic, selenium, tin, tin, tin, pyrene, lead, etc. Mryphory can generate gaseous atomic mercury; cadmium and zinc can generate gaseous components, which can be used from the solution. After mixing with the gaseous and hydrogen, enter the atomic (and be ignited). The atomic steam that is transformed into a base state is stimulated by the resonance line generated by the hollow cathode lamp of this element. Release. The content of the measured element in the sample of the sample is proportional to the measured element based on the concentration of the atomic fluorescent intensity.

2. Precautions for the Use of Atomic Fluorescence Measuring Meters

- (1) The temperature of the laboratory is 15-30 ° C, and the humidity is less than 75%.
- (2) It should be equipped with a precision voltage supply and the power supply should be well grounded.
- (3) The back of the instrument platform should be 50cm away from the wall surface, which is convenient for the installation and maintenance of the instrument.
- (4) The purity of the air is more than 99.99%, and it is equipped with a standard oxygen decompression table.
- (5) The glassware should be cleaned, soaked in acid, and is dedicated to atomic fluorescence.
- (6) The purity of the reagents should meet the requirements, and generally requires superior purity.
- (7) Standard reserve solution shall be replaced regularly, and the standard use solution and reducing agent shall be available.
- (8) Be sure to turn off the host power when replacing the element light.
- (9) Pay attention to the order of booting is computer, instrument host, sequential injection or dual pump.
- (10) Check whether there is water in the secondary gas fluid separator (water seal) before use.
- (11) The preheating instrument should be operated for 1h before measurement. Other software operations cannot be performed during the measurement process. Pay attention to the gas liquid separator during the reaction process.
- (12) The sample must be clarified, there must be no impurities, and the standards and samples with high concentration (AS concentration is less than 100ug/ml, and HG concentration is less than 10ug/ml).

3. Precautions for Atomic Fluorescent Mercury Measurement

- (1) During the processing of the sample, according to the characteristics of the sample, you can appropriately reduce or increase the type and dosage of acid, and select the pre -processing method suitable for the sample.
- (2) Pay attention to checking the blank of the reagent of the full -program during the test, and the reagent or utensil pollution should be re-tested.
- (3) Wang Shui has a stronger solubility capacity than a single acid, which can effectively dissolve mercury sulfide. When preparing Wang Shui, the proportion of hydrochloric acid to nitric acid can be appropriately adjusted. Under the conditions of hydrochloride, a large number of Cl⁻ and Hg²⁺ effects form a stable [HgCl₄]²⁻ ion, which can inhibit the adsorption and volatilization of mercury.
- (4) During the pre -treatment, the cover should be eliminated, and the opening and elimination temperature should not exceed 110 ° C. Conditional can be used to use closed microwave to prevent mercury from being lost in the form of chloride.

(5) When the sample contains more organic objects, the amount of king water can be appropriately increased. Due to the impact of environmental factors and the limitations of instrument stability, the calibration curve must be drawn at the same time when the sample is determined. Standard samples can purchase national standards. Dilute after leveling.

(6) When the mercury content in the sample is high, it is not possible to determine directly, and the amount of the sample should be appropriately reduced, or it is diluted and then on the machine to test.

(7) The samples should be measured as soon as possible. Generally, only 2 to 3D allowed to be saved, and the storage solution should be added to prevent mercury loss.

(8) During testing, the excitement of mercury atoms and certain atomic compounds (oxygen, nitrogen, carbon dioxide, etc.) occur with energy transmission and "fluorescent quenching". The load is connected into the fluorescent pool to help improve the sensitivity and stability of the test. Avoid air and water vapor into the fluorescent pool during operation.

(9) The substance that can strongly absorb 235.7nm mercury lines and emits fluorescence (such as aromatic compounds such as benzene, toluene and other aromatic ethnic compounds), which will cause severe interference to the test. Avoid introducing such interference during testing.

4. Precautions for Atomic Fluorescence Arsenic Measurement

(1) During the pre -treatment process, the temperature should not be too high. When the temperature is high, the arsenic may be volatilized by high temperature, which affects the measurement results. The temperature should be at 110 ° C.

(2) After the sample is decomposed before, the arsenic generally exists in a high -priced state. The high -priced arsenic must be reduced to a low -cost state before it can effectively generate arsenic hydrogenation. Therefore, it is necessary to add hydrochloric acid and sulfurized for pre -restoration, reducing the pre -restoration, and reducing. The acidity is greatly affected, and the concentration of hydrochloric acid is 10%to 20%.

(3) After the sample is processed before, most elements in the soil can be decomposed into the survey liquid. Among them, Cu^{2+} , CO_2^{+} , Ni^{2+} , Cr^{6+} , Hg^{2+} , etc. will be interfered, and adding sulfur can eliminate these interference.

(4) Each batch of sample tests need to be drawn for standard curves. The standard curve concentration range should be selected according to the instrument conditions and different arsenic content in the sample. Standard samples can be used to use national standards to be diluted step by step.

5. Precautions

(1) When measuring the mercury content, turn on the power supply and sequential syringe power of the instrument host. If the mercury lamp does not light up, use ignition. There is no need to ignite when the mercury measurement is measured.

(2) Check whether the element light spots are positive and adjust with the photographer.

(3) After the test, clean should be performed. Click the cleaning program to put the capillary and reducing the capillary in the water and click clean. When cleaning, clean the instrument without ignition.

(4) After cleaning, turn off the software, turn off the host power supply and sequential syringe power, loosen the pump pipe block, turn off the computer, and turn off.

(5) The sample tube, capacity bottle, and all the utensils used in are used again. Wash it again, soak it with 10%nitric acid and clean it.

- (6) Due to the high sensitivity of the instrument, special attention should be paid to pollution in all aspects.
- (7) If the sample substrate is more complicated, the interference should be excluded as much as possible.
- (8) When installing the element lamp, the light plugs must be consistent with the concave plague of the socket, and do not bring a power plug, otherwise it will damage the instrument.
- (9) Open the gas cylinder first to prevent the liquid from pouring and corroding the gas road system.
- (10) The maintenance of the pump tube must be proper. Pay attention to the tightness of the pipe head. Note that there must be no leakage pump tube.
- (11) If the power outage is out of the case, turn off the power switch, close the valve of the cylinder, and then start the test after call.

Acknowledgments

This work is supported, in part, by Innovation Capability Support Program of Shaanxi(Progrm No.2021PT-053).

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