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Soil testing -

Part 10: Method for determination of soil total hydrargyrum

土壤检测

第 10 部分：土壤中总汞的测定

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Foreword

NY/T 1121 Soil testing is a standard series, which include the following parts:

- Part 1: Soil sampling, processing, and reposition;
- Part 2: Method for determination of soil pH;
- Part 3: Method for determination of soil mechanical composition;
- Part 4: Method for determination of soil bulk density;
- Part 5: Method for determination of soil cation exchange capacity in calcareous soil;
- Part 6: Method for determination of soil organic matter;
- Part 7: Method for determination of available phosphorous in acid soil;
- Part 8: Method for determination of soil available boron;
- Part 9: Method for determination of soil available molybdenum;
- Part 10: Method for determination of soil total hydrargyrum;
- Part 11: Method for determination of soil total arsenic;
- Part 12: Method for determination of soil total chrome;
- Part 13: Method for determination of soil exchangeable calcium and magnesium;
- Part 14: Method for determination of soil available sulphur;
- Part 15: Method for determination of soil available silicon;
- Part 16: Method for determination of total water-soluble salt;
- Part 17: Method for determination of soil chloride ion content;
- Part 18: Method for determination of soil sulphate content;

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This part is part 10 of NY/T 1121.

This part was proposed by AND shall be under the jurisdiction of Ministry of Agriculture of the People's Republic of China.

Soil testing -

Part 10: Method for determination of soil total hydrargyrum

1 Scope of application

This part is applicable to the determination of trace hydrargyrum in soils.

The minimum detectable amount for this part is 0.04 ng hydrargyrum. If weighing 0.5 g sample for measurement, the minimum detection limit is 0.002 mg/kg, AND the measurement upper limit can reach to 0.4 mg/kg.

2 Method summary

Ground-state hydrargyrum atoms are excited by ultraviolet light at a wavelength of 235.7 nm to produce resonance fluorescence. The fluorescence concentration is directly proportional to the concentration of hydrargyrum under certain measurement conditions and in the lower concentration range.

As for the sample, USE the nitric acid-hydrochloric acid mixed reagent to make it dissolve in a boiling water bath, to make all the hydrargyrum contained dissolve into solution in the form of divalent hydrargyrum, then USE the potassium borohydride to reduce the divalent hydrargyrum to elemental hydrargyrum AND form hydrargyrum vapour, which is led by the carrier gas into the fluorescence pool of the instrument, in order to measure the fluorescence peak AND obtain the hydrargyrum content in sample.

3 Instruments and equipment

3.1 Atomic fluorescence spectrometer

3.2 Argon or high purity nitrogen cylinders

stable $[HgCl]^{2-}$ complex ion, which can inhibit the adsorption and volatile of hydrargyrum. However, it shall avoid using the boiled aqua regia to process the sample, in order to prevent the loss of hydrargyrum in the form of chloride volatilization. When the sample contains a large amount of organic substances, it may appropriately increase the concentration and dosage of nitric acid - hydrochloric acid mixed reagent.

3) Due to environmental factors and the limit of instrument stability, during the measurement of each batch of samples, DRAW calibration curve. If the sample contains too much hydrargyrum, it shall not conduct measurement directly BUT appropriately reduce the weighed sample, in order to make the hydrargyrum content in the sample be within the straight line range of the calibration curve.

4) After sample digestion is completed, usually ADD the preservation solution and dilution in order to avoid hydrargyrum loss. However, samples shall be measured as early as possible, AND under normal circumstances, it is only allowed to be preserved for 2d ~ 3d.

5) The hydrargyrum atoms at excited state and certain atoms or compounds (such as oxygen, nitrogen and carbon dioxide, etc.) collide, causing energy transfer and generating fluorescence quenching; therefore, USE the inert gas argon or high purity nitrogen as carrier gas into the fluorescent pool, to improve the sensitivity and stability of the test. During operation, it shall pay attention to avoid air or water vapor into the fluorescent pool.

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