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Reclaimed water quality - Determination of mercury - Mercury analyzer method

再生水水质 汞的测定 测汞仪法

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Reclaimed water quality - Determination of mercury - Mercury analyzer method

1 Scope

This Standard specifies the method for measuring the mercury content in reclaimed water -- catalytic pyrolysis cold atomic absorption mercury analyzer method.

This Standard is applicable to the determination of mercury content in reclaimed water. The measurement range is 0.1 μg/L ~ 100 μg/L. When the mass concentration exceeds 100 μg/L, it needs to be measured after dilution. This Standard is also applicable to the determination of mercury in surface water and wastewater.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the dated version applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 5750.2, Standard examination methods for drinking water - Collection and preservation of water samples

GB/T 6682, Water for analytical laboratory use - Specification and test methods

3 Method summary

After the sample is dried and thermally decomposed, the gas products are transported to the catalytic furnace by oxygen; halogen, nitrogen oxides, and sulfur oxides are captured; the remaining products are taken into the gold amalgam adsorption device, which is fully heated to release mercury vapor. Oxygen brings mercury vapor into the absorption cell. Measure the absorbance of mercury at a wavelength of 253.7 nm.

4 Reagents or materials

Caution -- The strong acid which is used in this Standard is corrosive. Avoid inhalation or contact with the skin during use. Use plenty of water

to rinse immediately if it is splashed on the body. Seek medical attention immediately if it is serious. Mercury and its compounds are very toxic. Enhance ventilation during operation. Operators shall wear protective equipment to avoid contact with skin and clothing. The treatment of mercury concentrated liquid shall be entrusted to the relevant qualified units.

4.1 Unless otherwise stated, the reagents that are used in the analysis are all guaranteed reagents; the test water is the grade-1 water that is specified by GB/T 6682.

4.2 Nitric acid: guaranteed reagent.

4.3 Nitric acid solution: 1+19.

4.4 Mercury standard stock solution: 1 000 mg/L. Weigh 0.135 4 g of guaranteed mercury chloride; dissolve it in 75 mL of water; add 5 mL of nitric acid; then, transfer it into a 100 mL volumetric flask; use water to dilute to the mark; mix well. Or use a commercially available standard solution.

4.5 Mercury standard solution I: 10 mg/L. Accurately transfer 1 mL of mercury standard stock solution; use nitric acid solution to dilute it to 100 mL.

4.6 Mercury standard solution II: 1 mg/L. Accurately transfer 10 mL of mercury standard solution I; use nitric acid solution to dilute it to 100 mL. Formulate the solution when needed.

4.7 High purity oxygen: purity ≥ 99.999%.

5 Instruments and apparatuses

5.1 Mercury analyzer: it is equipped with thermal decomposition furnace, catalytic furnace, cold atomic absorption spectrometer, gold amalgam adsorption device and data processing system.

5.2 Sample boat: nickel or quartz.

6 Sample collection and preservation

Collect and preserve water quality samples according to GB/T 5750.2.

7 Determination steps

7.1 Setting of instrument test conditions

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