

HG SERIES

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MERCURY in Pure Copper

Issued: June 2008

Method: Cold Vapor Atomic Absorption

Applicable methods: *ICS 77.120.30 / JIS H 1066*

【Outline】

Mercuric compounds in sample are broken down and oxidized to mercuric ions by strong acids and oxidant in pretreatment. Mercury is reduced to Hg(0) state by stannous chloride and aerated, then pass through the absorption cell to be measured at 253.7nm absorbance based on AAS.

【Configurations】

HG-400-5D (5mL testing size, Dispenser D-401 equipped)

【Reagents】

◆for Pretreatment

Mixed acid (conc. Nitric acid : Sulfuric acid(1+2) =1:3),
Urea solution (50g/L), Potassium permanganate (50g/L),
Hydroxylammonium chloride (200g/L)

◆for Calibration curve

Hg standard solution 100ngHg/mL
(prepare 0, 10, 20, 50ngHg/mL standard solutions
by changing dilution rate.)

◆for Measurement

Stannous chloride, Sulfuric acid (1+1)



【Sample Pretreatment】

1. Accurately weigh approx. 1g of sample and transfer to a decomposition flask, and then attach a reflux condenser.
2. Add 20mL of mixed acid and gently heat to decompose.
3. Cool and add 10mL of urea solution (50g/L) and boil for 5 minutes.
4. Cool slightly and add 30mL of distilled water and 5mL of potassium permanganate solution (50g/L). And then boil for 20 minutes.
5. Cool and rinse the reflux condenser before removed.
6. Add hydroxylammonium chloride (200g/L) to reduce the excess permanganate until the red color disappears.
7. Transfer the solution to a volumetric flask and add distilled water to make a total volume of 200mL.

~Solution for Reagent blank

8. Prepare another flask and add the same amount of the reagents and carry out the same process as described above without sample.

【Calibration curve】

Proceed Hg standard solutions (0, 10, 20, 50ngHg/mL) to construct a calibration curve.

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【Reagent Blank Measurement】

1. Transfer 5mL of the solution for Reagent blank to a reaction vessel and attach it to the bubbler. (BLK2)
2. Touch **START** key. 0.5mL of stannous chloride solution is automatically added and bubbling starts.
3. The amount of Hg in the reagent blank is determined and used to correct the absorbance value of the sample.

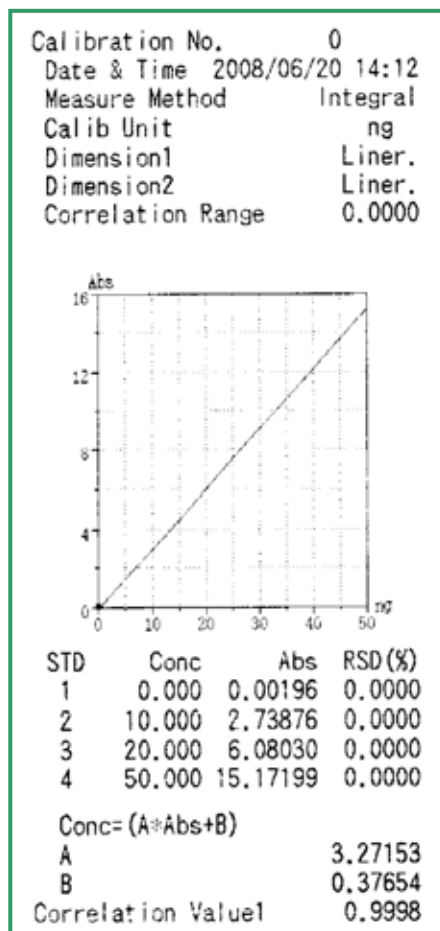
【Sample Measurement】

1. Transfer 5mL of the sample solution to a reaction vessel and attach it to the bubbler.
2. Touch **START** key. 0.5mL of stannous chloride solution is automatically added and bubbling starts. Concentration of mercury is obtained by absorbance at 253.7nm corresponding to the calibration curve.

【Example results】

Sample Size (g)	Testing size (mL)	Sample No.	Mercury (ng)	Mercury Conc. (ppb)	Statistics	
1.1127	5	1	0.05	1.8241	MEAN (ppb)	1.6
		2	0.04	1.3896	SD (ppb)	0.23
		3	0.05	1.7158	CV (%)	14

【Calibration Curve】



【Abs. Curve】

