

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

HJ 910-2017

**Ambient air -- Determination of gaseous mercury -- Gold
amalgamation collection and analysis by cold vapor atomic
absorption spectrophotometry**

环境空气 气态汞的测定 金膜富集冷原子吸收分光光度法 含2018年第1号修改单
(English Translation)

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Foreword

In order to implement the Law of the People's Republic of China on Environmental Protection and the Law of the People's Republic of China on Prevention and Control of Atmospheric Pollution, Habitat, to protect human health, regulate the determination of gaseous mercury in the ambient air, the development of this standard.

This standard specifies the determination of gaseous mercury in the air atmosphere gold film enrichment/cold atomic absorption spectrophotometry.

This standard Appendix A normative appendix, Appendix B is an informative annex.

This standard is released for the first time.

This standard by the Environmental Protection Department of Environmental Monitoring Division and Science and Technology Standards Division to develop.

This standard was drafted. Beijing Environmental Protection Monitoring Center.

This standard verification unit. Shanghai Jiading District Environmental Monitoring Station, Songjiang District, Shanghai Environmental Monitoring Station, Dongcheng District, Beijing

Environmental Protection Monitoring Station, Beijing Kangju Environmental Monitoring Station, Changping District, Beijing Environmental Protection Monitoring Station and Beijing Environmental Protection Monitoring Center.

This standard MEP approved on December 29, 2017.

This standard since April 1, 2018 come into operation.

This standard is interpreted by the MEP.

Ambient air - Determination of gaseous mercury - Gold enrichment/cold atomic absorption Spectrophotometry Warning. Mercury and its compounds used in the experiment are toxic. All sample pretreatments should be done in a fume hood. During operation Wear protective equipment as required to prevent inhalation of airways and skin and clothing.

1 Scope of application

This standard specifies the determination of gaseous mercury in the air atmosphere gold film enrichment/cold atomic absorption spectrophotometry.

This standard applies to the determination of gaseous mercury in the ambient air.

When the sampling volume is 60 L (60 min, standard state), the detection limit of the method is 2 ng/m³ and the lower limit of determination is 8 ng/m³.

When the sampling volume is 1440 L (24 h, standard state), the detection limit of this method is 0.1 ng/m³ and the lower limit of determination is 0.4 ng/m³.

2 Normative references

This standard references the following documents or the terms. For undated references, the effective version applies to this book standard.

HJ 194 Manual Air Quality Monitoring Technical Specifications

3 Method principle

The mercury in the ambient air is collected by the gold film microparticle mercury enrichment tube to generate gold amalgam on the gold film surface. Will be sampled the enrichment tube is heated and analyzed at 600 ° C or above, and the mercury is quantitatively released. When the carrier gas enters the mercury analyzer, it is re-enriched and Analytical, at 253.7 nm, determined by cold atomic absorption spectrophotometry.

4 Interference and elimination

Acid and alkali gases and water vapor directly into the cold atomic absorption cell will affect the determination of mercury results. At cold atomic absorption pass Gas pipeline in series

with a buffer filled with gas washing buffer bottle and a water buffer bottle (empty bottle), which can effectively eliminate dry Disturb

5 Reagents and materials

Unless otherwise stated, analytical grade reagents that meet national standards are used. Experimental water for the newly prepared resistivity Deionized water greater than or equal to 18 Mohm · cm.

5.1

anhydrous calcium chloride (CaCl_2). excellent grade pure.

5.2

Potassium dichromate ($\text{K}_2\text{Cr}_2\text{O}_7$). excellent grade pure.

5.3

Mercuric chloride (HgCl_2). excellent grade pure.

Before use, dry it at 105 °C for 2 h and place it in a silica gel dryer.

5.4

Stannous chloride ($\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$). excellent grade pure.

5.5

Sodium hydroxide (NaOH). excellent grade pure.

5.6

potassium dihydrogen phosphate (KH_2PO_4). excellent grade pure.

Before use, dry it at 105 °C for 2 h and place it in a silica gel dryer.

5.7

Disodium hydrogen phosphate (Na_2HPO_4). excellent grade pure.

Before use, dry it at 105 °C for 2 h and place it in a silica gel dryer.

5.8

Hydrochloric acid (HCl). $\rho = 1.19 \text{ g/ml}$, excellent grade pure.

5.9

sulfuric acid (H_2SO_4). $\rho = 1.84 \text{ g/ml}$, excellent grade pure.

5.10

Nitric acid (HNO_3). $\rho = 1.42 \text{ g/ml}$, excellent grade pure.

5.11

stannous chloride solution. $\rho(\text{SnCl}_2 \cdot 2\text{H}_2\text{O}) = 0.25 \text{ g/ml}$.

Weigh 25.0 g of stannous chloride (5.4) in a 150 ml dry beaker, add 25 ml of hydrochloric acid (5.8) and heat until all dissolved After solution, dilute to 100 ml with experimental water. Nitrogen (5.22) was purged with a blower (6.6) at 1.0 L/min for 15 min Above to remove mercury. Pro use now with.

5.12

Sodium hydroxide solution. $\rho(\text{NaOH}) = 0.30 \text{ g/ml}$.

Weigh 30.0 g of sodium hydroxide (5.5) in a 150 ml dry beaker and dilute to 100 ml with a small amount of experimental water.

Store in polyethylene bottle.

5.13

phosphate buffer solution. pH~6.8.

Were accurately weighed 3.4 g of potassium dihydrogen phosphate (5.6) and 3.5 g of disodium hydrogen phosphate (5.7), in a 250 ml beaker the experimental water dissolved, transferred to a 1000 ml volumetric flask to volume. Commercially available phosphate buffered solutions may also be used.

5.14

buffer.

Prepared with phosphate buffer solution (5.13) and the experimental water volume ratio of 1.1.

5.15

sulfuric acid solution. 1 49.

Prepared with sulfuric acid (5.9) and experimental water at a volume ratio of 1.49.

5.16

Fixative. $\rho(\text{K}_2\text{Cr}_2\text{O}_7) = 0.5 \text{ g/L}$.

Weigh 0.5 g of potassium dichromate (5.2) was dissolved in 950 ml experimental water, then add 50 ml of nitric acid (5.10) at 4 °C the following refrigerated can be stored for 3 months.

5.17

Mercury standard stock solution. $\rho(\text{Hg}) = 100 \mu\text{g/ml}$.

Weigh 0.1354 g mercuric chloride (5.3), dissolved in a small amount of fixed solution (5.16), into a 1000 ml volumetric flask, Then dilute with fixative (5.16) to the mark. Store below 4 °C