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

GB/T 31947-2015

**Iron ores - Determination of mercury content - Solid sampling
and direct mercury analysis method**

铁矿石 汞含量的测定 固体进样直接测定法

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**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine;
Standardization Administration of the PRC**

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Foreword

This standard was drafted in accordance with GB/T 1.1-2009 given rules. The standard proposed by China Iron and Steel Association. This standard by the national iron ore and direct reduced iron Standardization Technical Committee (SAC/TC317) centralized. This standard was drafted. Tianjin Entry-Exit Inspection and Quarantine Bureau of Metallurgical Industry Information Standards Institute. The main drafters of this standard. Su Mingyue, Gu Songhai, Guo Fen, Yang Jinkun, right Li Bin, Wang Hong, Song Yi, Wang Haoyun, newly Hood, Chenzi Bin. Determination of mercury content of iron ore Direct solid sampling assay Warning

--- the use of this standard should have practical experience in regular laboratory work. This standard does not point out all possible security problem. Users have the responsibility to take appropriate safety and health practices and to ensure compliance with the conditions of the relevant provisions of the State.

1 Scope

China's national method for determining mercury in iron ore by direct analysis of a solid sample. It specifies the principle, the reagents, the apparatus, the sampling and sample preparation, the procedure, the calculation of results and the precision, and it applies to the determination of mercury in iron ore over the range from 0.005 to 5.00 micrograms per gram. Mercury in iron ore matters because of where it goes. It is volatile, so in a sinter plant or a blast furnace it does not stay in the metal or in the slag: it leaves with the off-gas, and either reaches the atmosphere or has to be captured by the gas cleaning plant. China is the largest importer of iron ore in the world, and mercury emissions from iron and steel making are a significant national inventory item, so knowing how much mercury arrives with a cargo is both an environmental and a commercial question. What makes the method notable is that it dispenses with digestion entirely. Conventional trace mercury analysis dissolves the sample in acid and measures the solution, which for mercury is exactly the wrong approach: mercury is volatile and is lost during digestion, it adsorbs onto vessel walls, and the acids used add their own blank. Here the solid sample is placed in the instrument and thermally decomposed in a stream of oxygen; the decomposition products pass through a

catalyst that removes interferences, the mercury released is selectively trapped as an amalgam on gold, and after the system is purged the amalgam is heated rapidly and the mercury vapour released is measured by single-wavelength atomic absorption. Nothing is dissolved, nothing is transferred, and the blank is negligible. Issued on 11 September 2015 and in force since 1 June 2016.

This standard specifies the method for determination of solid sampling mercury content measured directly. This standard applies to the determination of mercury content in iron ore, measuring range. 0.005µg/g ~ 5.00µg/g.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document. Preparation of standard solution of

GB/T 602 Determination of impurities in chemical reagents

GB/T 6379.2 measurement methods and results of Accuracy (trueness and precision) - Part 2. Determine the standard measurement method to repeat Of the basic methods of reproduction Laboratory use specifications and test methods GB/T 6682 Analysis

GB/T 8170 repair value expressed about the rules and limit values and judgment

GB/T 10322.1 iron ore sampling and sample preparation methods JJG548 mercury analyzer test procedures Principle

3 In an oxygen atmosphere, the sample was dried in calciner and thermal decomposition, the decomposition products by the catalytic oxygen stream is supplied to the furnace, the addition After impurities and catalytic decomposition, sample pyrolysis mercury into mercury atoms, selective capture by the flow of oxygen into the gold amalgam vessel. After purification system was purged with oxygen, rapid heating of the amalgam, a mercury vapor released. Mercury vapor is brought into the single-wavelength optical absorption cell at a wavelength 253.65nm mercury measured absorbance was quantified using the standard curve method.

4 Reagents and materials

Unless otherwise indicated in the analysis using only the gifted class pure reagents and in line with a water or equivalent purity water GB/T 6682 regulations.

4.1 nitric acid, rho1.42g/mL.

4.2 nitric acid solution, 119.

4.3 potassium dichromate.

4.4 potassium dichromate solution, 10g/L. Weigh 1g potassium dichromate (see 4.3) were dissolved in 100mL of water.

4.5 mercury standard stock solution, 100µg/mL. According to GB/T 602 method of preparation, or direct use of certified reference materials.

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