

ICS 77.150.99

CCS H 62



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

GB 913-2012

Replacing GB 913-1985

Mercury

汞

Issued on: May 11, 2012

Implemented on: April 1, 2013

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

1	Scope
2	Normative references
3	Requirements
3.1	Grades, brand designations and chemical composition of mercury
3.2	Appearance requirements
4	Test methods
4.1	Determination of mercury content and total ignition residue
4.2	Determination of iron content and lead content
4.3	Appearance examination
5	Inspection rules
5.1	Inspection and acceptance
5.2	Batch formation
5.3	Inspection items
5.4	Sampling
5.4.1	Sampling amount
5.4.2	Sampling method
5.5	Judgement of inspection results
6	Marking, packaging, transport, storage and quality certificate
6.1	Marking
6.2	Packaging
6.3	Transport
6.4	Storage
6.5	Quality certificate
7	Contract (or order form)
8	Safety

1 Scope

The standard fixes the requirements, test methods, inspection rules, marking, packaging, transport and storage of mercury, together with the quality certificate and the contract or order form.

It applies to mercury produced by pyrometallurgical smelting and by hydrometallurgical

smelting; the product is used in electrical instruments, reagents, pharmaceuticals, chemical industry, metallurgy and similar sectors.

2 Normative references

The following documents are indispensable for the application of the standard; for dated references only the edition cited applies, and for undated references the latest edition, including all amendments, applies.

GB 190 Packaging symbol of dangerous goods; GB 13690 Classification and labelling of commonly used dangerous chemicals; GB 15603 General rule for storage of chemical dangerous goods; GB/T 8170 Rules of rounding off for numerical values and expression and judgement of limiting values; GB/T 16483 Safety data sheet for chemical products-Content and order of sections; JJF 1070 Rule for the metrological testing of net quantity of products in prepackages.

3 Requirements

3.1 Mercury is divided into four grades by chemical composition, set out in Table 1. The table carries six columns: grade, brand designation, mercury content as a minimum, and three impurity limits given as maxima, namely total ignition residue, iron and lead; all figures are mass fractions in per cent.

3.1 The four rows read as follows. High-purity mercury, brand Hg-06: mercury not less than 99.999 9; total ignition residue not more than 0.000 1; iron not more than 0.000 04; lead not more than 0.000 04. Grade-zero mercury, brand Hg-055: mercury not less than 99.999 5; total ignition residue not more than 0.000 5; iron not more than 0.000 1; lead not more than 0.000 2. Grade-one mercury, brand Hg-05: mercury not less than 99.999; total ignition residue not more than 0.001; iron not more than 0.000 2; lead not more than 0.000 4. Industrial crude mercury, brand Hg-03: mercury not less than 99.9; total ignition residue not more than 0.1; no limit is given for iron or for lead, the two cells carrying a dash.

3.2 Apart from Hg-03, mercury of all grades is to have a silver-white lustre and is to be free of mechanical inclusions such as ash or dross; grade-zero mercury is to show a clear mirror surface; the surface of high-purity mercury is to carry no film of any kind.

3.2.1 For high-purity, grade-zero and grade-one mercury, a test sample of 5 g to 10 g is placed in a 200 mL beaker, 10 mL of nitric acid (1+1) is added and the sample is dissolved with heating; the solution is to be clear and free of undissolved matter.

3.2.2 A sample of high-purity, grade-zero or grade-one mercury is to pour freely out of a dry, clean glass vessel, and no mercury is to stay stuck to the wall.

3.2.3 A sample of high-purity, grade-zero or grade-one mercury is to leave no trace after being rolled over smooth white paper or a porcelain plate.

3.2.4 When a sample of high-purity mercury is examined on a white porcelain plate, no stain is to be visible to the naked eye.

3.2.5 Industrial crude mercury is silver-grey-white in appearance; the sample pours freely out of a dry, clean glass vessel, and a small amount of impurity visible to the naked eye is allowed on the wall.

4 Test methods

4.1 The mercury content and the total ignition residue are determined by the method laid down in Annex A of the standard.

4.2 The iron content and the lead content are determined by the methods laid down in Annex B and Annex C of the standard respectively.

4.3 The appearance is examined by visual inspection.

5 Inspection rules

5.1.1 The supplier provides a works inspection certificate of conformity, guarantees that the product quality meets the requirements of the standard, and fills in the quality certificate.

5.1.2 The purchaser may inspect the product received in accordance with the standard. Where the inspection result does not agree with the standard, the purchaser is to raise the matter with the supplier within 30 days from the day the product is received, and the two parties settle it by consultation. Where arbitration is needed, the arbitration sample is taken jointly by the two parties from the same batch as prescribed, and the testing body is designated by agreement between them.

5.2 Each batch is made up of mercury of one single grade. For high-purity mercury, grade-zero mercury, grade-one mercury and industrial crude mercury, the weight of one batch is not to exceed 1 t, 4 t, 7 t and 10 t respectively.

5.3 Each batch is to undergo determination of mercury content, total ignition residue, iron content and lead content, and examination of appearance.

5.4.1 The number of items (bottles or cans) sampled from each batch is not less than 10 %. The mass of test sample is prescribed as follows: high-purity mercury not less than 4 kg, grade-zero mercury not less than 1 kg, grade-one mercury not less than 0.6 kg, industrial crude mercury not less than 0.4 kg.

5.4.2 Samples are drawn in equal amounts with a glass tube of 4 mm to 6 mm inside diameter, and are placed in a clean stoppered ceramic bottle or an opaque glass bottle. After thorough mixing the sample is divided into two equal parts, one for the inspection and the other kept for reference; the reference sample is to be sealed and protected with nitrogen or argon, and the storage period of the sample is one year.

5.5.1 Rounding of numerical values and judgement of inspection results follow GB/T 8170.

5.5.2 Where the inspection results for all items meet the requirements of the standard, the batch is judged conforming.

5.5.3 Where any one of the inspection items is found not conforming, the batch is judged non-conforming.

6 Marking, packaging, transport, storage and quality certificate

6.1 Marking is to comply with GB 190.

6.2.1 High-purity mercury is packed in ceramic, polyethylene or polypropylene bottles of 100 mL capacity, each bottle holding 1 kg net, or in opaque glass bottles, filled with nitrogen or argon. The bottle mouth carries a T-shaped butyl rubber inner stopper, a turned-lip butyl rubber inner stopper, or a turned-lip natural rubber inner stopper covered with a plastic film; the outside is sealed with an aluminium-plastic composite cap or with a heat-shrink sleeve. Waste paper shreds or moulded foamed plastic are used as inner padding and the bottles are packed in a sturdy wooden case nailed with steel strapping. The packing specification is 1 kg x 20 bottles per case, the single weight being 1 +/- 0.002 kg.

6.2.2 Grade-zero mercury and grade-one mercury are packed in enamel-lined steel cans or in polyethylene cans, which are placed in a sturdy wooden case nailed with steel strapping. The net weight is 34.5 +/- 0.030 kg.

6.2.3 Industrial crude mercury is packed in steel cans, the single weight being 38.0 +/- 0.030 kg.

6.3 The transport of mercury of every grade is to observe strictly the national laws and regulations on the carriage of dangerous chemicals; carriage together with food, feed, articles of daily use or substances that would harm people and animals is forbidden.

6.4 Mercury of every grade is to be stored indoors at a temperature not higher than 40 °C and in accordance with GB 15603; stored under the conditions laid down in the standard, the storage period is one year. The cap of a high-purity mercury bottle is to be opened only at the time of use, so that the nitrogen or argon does not escape and cause surface oxidation.

6.5 Each batch carries a product quality certificate stating: a) the name, address, telephone and fax of the producing enterprise; b) the product name and grade; c) the batch number, net weight and number of items; d) the product inspection report; e) the number of the standard; f) the date of production.

7 Contract (or order form)

The contract or order form for the mercury covered by the standard is to include: a) the