

ICS 71.060.99

CCS G 14



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

GB/T 1615-2021

Replacing GB/T 1615-2008

Carbon disulfide for industrial use

工业二硫化碳

Issued on: August 20, 2021

Implemented on: March 1, 2022

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

Table of Contents

1	Scope
2	Normative references
3	Terms and definitions...
4	Molecular formula and relative molecular mass...
5	Requirements...
6	Test methods
6.3	Determination of distillation rate
6.3.3	Test procedure
6.3.3.1	Calculation of observed boiling range temperature Calculate according to
6.4	Determination of density
6.4.2	Instruments and apparatuses
6.4.2.1	Densimeter: density range
6.6	Determination of iodine reduction content
6.6.2	Reagents or materials Iodine standard titration solution: c(1/2I ₂) about
6.6.3	Instruments and apparatuses
6.6.3.1	Micro burette: graduation value
6.7	Determination of sulfate content
6.7.2	Reagents or materials
6.7.3	Instruments and apparatuses
6.8	Determination of free acid content
6.9	Tests of sulfur and other sulfides
7	Inspection rules
8	Marking, labeling...

1 Scope

GB/T 1615-2021 is the Chinese national standard on carbon disulfide for industrial use, in the field of chemical technology. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 20 August 2021 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 March 2022. Classification: ICS 71.060.99, CCS G 14. This page is published from the official record of the standard held

by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies the requirements, test methods, inspection rules and marking, labeling, packaging, transportation and storage of carbon disulfide for industrial use. This document applies to carbon disulfide for industrial use.

Note: This product is mainly used in the production of viscose fiber, cellophane, pesticides, rubber additives, flotation agents, chemical raw materials and solvents, etc.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB/T 191-2008, Packaging - Pictorial marking for handling of goods

GB/T 615-2006, Chemical reagent - General method for the determination of distillation range

GB/T 6678, General principles for sampling chemical products

GB/T 6680, General rules for sampling liquid chemical products

GB/T 6682-2008, Water for analytical laboratory use - Specification and test methods

GB/T 8170, Rules of rounding off for numerical values & expression and judgment of limiting values

6 Test methods

6.1 General provisions The reagents and water used in this document refer to analytical reagents and grade-3 water specified in GB/T 6682-2008, unless other requirements are specified. The standard titration solutions, preparations and products used in the test shall be prepared according to the provisions of HG/T 3696.1 and HG/T 3696.3 unless other requirements are specified.

6.2 Appearance inspection In the fume hood, pipette an appropriate amount of sample into the colorimetric tube and seal it with water; judge it visually under natural light.

6.3 Determination of distillation rate

6.3.1 Principle Use the method of distillation to measure the distilled volume of the sample at boiling range 45.6 °C ~ 46.6 °C.

6.3.2 Instruments and apparatuses Same as Appendix A of GB/T 615-2006.

6.3.3.1 Calculation of observed boiling range temperature Calculate according to

6.1 in GB/T 615-2006.

6.3.3.2 Distillation In a well-ventilated fume hood, install the distillation device as shown in Figure 1 in GB/T 615-2006; remove the outer cover of the distillation flask; replace it with a water bath for heating and distillation; use an ice-water bath to cool the outside of the receiver. Use a clean and dry receiver to measure $100\text{ mL} \pm$

0.5 mL of the sample at a temperature of $5^{\circ}\text{C} \sim 10^{\circ}\text{C}$; pour it into the distillation flask; do not let it flow into the branch pipe; add a few clean and dry zeolites; use a stopper inserted with a thermometer to close the distillation flask containing the sample. Make the axes of the thermometer and the distillation flask coincide, and make the upper end of the mercury bulb and the lower edge of the inner wall of the branch pipe of the distillation flask on the same horizontal line. Attach the auxiliary thermometer to the main thermometer; locate the mercury bulb at $1/2$ of the height of the mercury column exposed outside the plug of the main thermometer. Place the receiver (without drying) at the lower end of the condenser tube, so that the mouth of the condenser tube enters the receiver part by not less than 25 mm , and is not lower than the 100 mL scale line; cover the mouth with wetted filter paper; place the receiver in a water batch at $5^{\circ}\text{C} \sim 10^{\circ}\text{C}$. Connect the cooling water; immerse the spherical part of the distillation flask in a water bath preheated to about 50°C ; control the time from the beginning of heating to the first drop of distillate dripping into the receiver to be $5\text{ min} \sim 10\text{ min}$. Record the temperature of the main thermometer (initial boiling point) and the reading of the auxiliary thermometer when the first drop of distillate flows out. Control the temperature of the water bath at about 75°C , and the distillation rate at $3\text{ mL/min} \sim 5\text{ mL/min}$. The liquid level of the water bath shall not exceed the carbon disulfide liquid level at all times. When the thermometer reading just exceeds the final boiling point temperature (calibrated and calculated according to 6.3.3.1), immediately remove the water bath, leave it for 5 min , and record the distillate volume. When the initial boiling point temperature corrected by

6.3.3.1 is not lower than 45.6°C , the distillate volume value is the distillation rate. Take the arithmetic mean of the parallel determination results as the determination result; the absolute difference between the two parallel determination results shall not be larger than 0.5% .

6.4 Determination of density

6.4.1 Principle Use a densimeter to measure the density of the sample; then, convert it to the density at 20°C according to the formula.

6.4.2.1 Densimeter: density range

1.300 g/mL, division value

0.001 g/mL.

6.4.2.2 Thermometer: temperature range 0 °C ~ 50 °C, division value 0.5 °C.

6.4.3 Test procedure Inject the sample into a 200 mL graduated cylinder; put the densimeter in; read the density (reading on the lower edge of the meniscus) after the densimeter is suspended and stabilized; measure the temperature of the sample.

6.4.4 Test data processing Calculate the density (ρ_{20}) of carbon disulfide according to Formula (1): Where: Take the arithmetic mean of the parallel determination results as the determination result; the absolute difference between the two parallel determination results shall not be larger than 0.001%.

6.6 Determination of iodine reduction content

6.6.1 Principle Use iodine standard titration solution to titrate the sample, where the end point is indicated by the pink color of a slight excess of iodine in carbon disulfide solution.

6.6.2 Reagents or materials Iodine standard titration solution: $c(1/2I_2)$ about

0.01 mol/L; use a pipette to pipette 10 mL of iodine standard titration solution prepared and calibrated according to HG/T 3696.1; put it in a 100 mL volumetric flask; use freshly boiled and cooled water to dilute to the mark; shake well; prepare just before use.

6.6.3.1 Micro burette: graduation value

0.02 mL.

6.6.3.2 Iodine measuring bottle: 150 mL.

6.6.4 Test procedure Use a clean and dry iodine measuring bottle to weigh about 50 g of sample, accurate to

0.1 g; use iodine standard titration solution for titration; add 1 ~ 2 drops each time; cover the bottle cap and shake for 15 s until a stable pink color appears in the carbon disulfide layer.

6.6.5 Test data processing Calculate the iodine reduction content, by the mass fraction w_2 of hydrogen sulfide (H_2S), according to Formula (3): Where: V - the value of the volume of the iodine standard titration solution consumed by the titration sample, in milliliters (mL); c - the exact value of the concentration of the iodine standard titration solution, in moles per liter (mol/L); M - the value of the molar mass of hydrogen sulfide ($1/2H_2S$), in grams per mole (g/mol) ($M = 17.04$); m - the value of the sample mass, in grams (g). Take the arithmetic mean of the parallel determination results as the determination result; the