HG

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Chemical reagent - Copper (I) chloride

化学试剂

氯化亚铜

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Table of Contents

Chemical reagent - Copper (I) chloride

1 Scope

This standard specifies the traits, specifications, tests, inspection rules, packaging and marking of “Chemical reagent - Copper (I) chloride”.

This standard applies to the inspection of “Chemical reagent - Copper (I) chloride”.

Molecular formula: CuCl

Relative molecular mass: 99.00 (in accordance with the 2007 International relative molecular mass).

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this standard.

GB/T 601 Chemical reagent - Preparations of standard volumetric solutions

GB/T 602 Chemical reagent - Preparations of standard solutions for impurity

GB/T 603 Chemical reagent - Preparations of reagent solution for use in test

GB/T 610-2008 Chemical reagent - General method for the determination of arsenic

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

GB/T 9723-2007 Chemical reagent - General rule for flame atomic absorption spectrometry analysis

GB/T 9728 Chemical reagent - General method for the determination of sulphate

GB/T 9738 Chemical reagent - General method for the determination of water insoluble matter

GB 15346 Chemical reagent - Packaging and marking

slowly ADD 80 mL of sulfuric acid, COOL it down, DILUTE it to 500 mL.

5.3.2 Method of determination

WEIGH 0.3 g of sample, accurate to 0.0001 g. DISSOLVE it into 25 mL of ammonium ferric sulfate solution (heat to dissolve it if necessary), ADD 100 mL of water and 2 drops of 1,10-phenanthroline ferrous indicator liquid, USE the standard titration solution of ammonium cerous sulphate {c[$2(NH_4)_2SO_4 \cdot Ce(SO_4)_2$] = 0.1 mol/L} to titrate the solution until it becomes bright green. Meanwhile MAKE the blank test.

The mass fraction w of the copper (I) chloride is calculated in accordance with the formula (1):

$$w = [(V_1 - V_2)\, cM / (m \times 1000)] \times 100\% \quad \text{..... (1)}$$

Where:

V_1 - The value of volume of the standard titration solution of ammonium cerous sulphate consumed by the sample, in the unit of millimeters (mL);

V_2 - The value of volume of the standard titration solution of ammonium cerous sulphate consumed by the blank test, in the unit of millimeters (mL);

c - The accurate value of the concentration of the standard titration solution of ammonium cerous sulphate, in the unit of molar per liter (mol/L);

M - The value of the molar mass of the copper (I) chloride, in the unit of grams per mole (g/mol) [M (CuCl) = 99.00];

m - The value of the mass of the sample, in the unit of grams (g).

5.4 Acid insoluble matter

WEIGH 20 g of sample, ADD 40 mL of water and 80 mL of hydrochloric acid, HEAT to dissolve it, slowly ADD 10 mL of nitric acid, carefully HEAT to boil it, COOL it down, DILUTE it to 200 mL, MAINTAIN the temperature for 1 h in water bath, MAKE determination in accordance with the provisions of GB/T 9738. Among them, USE several drops of water which had been acidified by hydrochloric acid to rinse the filter residue, until the washing solution has no copper ion reaction.

5.5 Sulfate

WEIGH 0.5 g of sample, ADD 5 mL of water and 2 mL of nitric acid, carefully HEAT to dissolve it, BOIL it, COOL it down, DILUTE it to 100 mL. TAKE 2 mL, ADD 2 mL of hydrochloric acid solution (20%), EVAPORATE it dry in water bath, then ADD 2 mL of hydrochloric acid solution (20%), EVAPORATE it dry,

DISSOLVE it into water (filter it if necessary), DILUTE it to 20 mL, ADD 0.5 mL of hydrochloric acid solution (20%) to acidify it, MAKE determination in accordance with the provisions of GB/T 9728. The turbidity of the solution shall not be greater than the standard turbidity solution.

The standard turbidity solution is prepared as follows: TAKE the following amount of the sulfate (SO_4) standard solution, MAKE it subject to same treatment together with the residues which are evaporated dry.

Analytical pure: 0.02 mg; chemical pure: 0.04 mg.

5.6 Arsenic

5.6.1 Preparation of ammonium ferric sulfate solution (10 g/L)

WEIGH 1 g of ammonium ferric sulfate dodecahydrate (III), DISSOLVE it into water, ADD 2 drops of sulfuric acid, DILUTE it to 100 mL.

5.6.2 Method of determination

WEIGH 1 g of sample, ADD 10 mL of water and 2 mL of nitric acid, carefully HEAT to dissolve it, BOIL it for 2 min. DILUTE it to 40 mL, BOIL it. ADD 1 mL of ammonium ferric sulfate solution (10 g/L), ADD drops of ammonia solution (10%) until the produced precipitation dissolves, to make it excess 2 mL; MAINTAIN the temperature in water bath for 30 min. USE the No.3 glass filter to filter it, USE ammonia solution (1 + 25) to rinse it until the blue color disappears completely, MAKE another 3 rinsing. USE 2 mL of hot hydrochloric acid solution (20%) to dissolve the precipitation on the filter crucible, USE water to rinse it, COLLECT the filtrate and the washing solution, DILUTE it to 50 mL. TAKE 10 mL, DILUTE it to 70 mL. MAKE determination in accordance with the provisions of clause 4.1 of GB/T 610-2008. The brownish yellow shown by the mercury bromide test paper shall not be deeper than that of the standard colorimetric test paper.

The standard colorimetric test paper is prepared as follows: TAKE the following amount of arsenic (As) standard solution, DILUTE it to 70 mL, MAKE it subject to the same treatment together with the same volume of test solution.

Analytical pure: 0.001 mg; chemical pure: 0.004 mg.

5.7 Sodium

5.7.1 Reagents, materials and instruments

They shall comply with the provisions of clause 5 and clause 6 of GB/T 9723-2007.

5.7.2 Conditions of instruments

5.9.2 Conditions of instruments

Light source: calcium hollow cathode lamp.

Wavelength: 422.7 nm.

Flame: acetylene-air.

5.9.3 Method of determination

WEIGH 10 g of sample, PLACE it into the beaker, ADD 30 mL of hydrochloric acid solution (20%), COVER the watch glass, slowly ADD 20 mL of 30% hydrogen peroxide. After the reaction is finished, PLACE it on the electric furnace to heat it almost dry, COOL it down, USE water to dissolve it, TRANSFER it into a 100 mL volumetric flask, DILUTE it to the mark, SHAKE it uniformly. TAKE 10 mL, totally 4 sets. MAKE determination in accordance with the provisions of clause 7.2.2 of GB/T 9723-2007. CALCULATE the result in accordance with the provisions of clause 7.2.3.

5.10 Iron

5.10.1 Reagents, materials and instruments

They shall comply with the provisions of clause 5 and clause 6 of GB/T 9723-2007.

5.10.2 Conditions of instruments

Light source: iron hollow cathode lamp.

Wavelength: 248.3 nm.

Flame: acetylene-air.

5.10.3 Method of determination

WEIGH 10 g of sample, PLACE it into the beaker, ADD 30 mL of hydrochloric acid solution (20%), COVER the watch glass, slowly ADD 20 mL of 30% hydrogen peroxide. After the reaction is finished, PLACE it on the electric furnace to heat it almost dry, COOL it down, USE water to dissolve it, TRANSFER it into a 100 mL volumetric flask, DILUTE it to the mark, SHAKE it uniformly. TAKE 20 mL, totally 4 sets. MAKE determination in accordance with the provisions of clause 7.2.2 of GB/T 9723-2007. CALCULATE the result in accordance with the provisions of clause 7.2.3.

6 Inspection rules

MAKE sampling and acceptance in accordance with the provisions of HG/T

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