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

GB/T 603-2023

**Chemical reagent - Preparations of reagent solutions for use in
test methods**

化学试剂 试验方法中所用制剂及制品的制备

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Foreword

This document was issued on 6 August 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 March 2024.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

1 Scope

GB/T 603-2023 covers the preparations and products a laboratory has to make up itself before it can run the test methods for chemical reagents - the general provisions that fix the grade of reagent allowed, and the preparation methods themselves, written out recipe by recipe for the indicator solutions, buffer solutions, test solutions and auxiliary products the reagent test methods call for. The general provisions tie the work to GB/T 601 and GB/T 602 for standard titration solutions and standard solutions, so that the three documents together account for every solution a reagent laboratory prepares in-house. Writing the recipes down is what makes results comparable: an indicator made up at a different strength, or in a different solvent, moves the colour change an analyst reads as the endpoint, and two laboratories testing the same batch then disagree for reasons that have nothing to do with the batch. The preparation clause also carries a warning that some of the reagents involved are toxic or corrosive and that some steps can become dangerous, leaving the operator responsible for the safety and health measures. Written for reagent manufacturers, testing and calibration laboratories, and the bodies that verify reagent quality.

This document specifies the preparation methods for reagent solutions for use in test methods

of chemical reagent.

This document is applicable to the preparation of preparations and products required for chemical reagent analysis. It can also be used in other fields.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. In terms of references with a specified date, only

versions with a specified date are applicable to this document. In terms of references without a

specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 601 Chemical Reagent - Preparations of Standard Volumetric Solutions

GB/T 602 Chemical Reagent - Preparations of Standard Solutions for Impurity

GB/T 6682 Water for Analytical Laboratory Use - Specification and Test Methods

GB/T 9733 Chemical Reagent - General Method for the Determination of Carbonyl Compounds

3 Terms and Definitions

This document does not have terms or definitions that need to be defined.

4 General Provisions

4.1 Unless otherwise specified in this document, the reagents used shall be of analytically pure

(including analytically pure) or above. The standard titration solutions and standard solutions

used shall be prepared in accordance with the stipulations of GB/T 601 and GB/T 602. The test

water shall comply with the specifications of Grade-3 water in GB/T 6682, and the reagents shall be weighed accurately to 0.01 g or measured accurately to 0.1 mL.

4.2 Unless otherwise specified in this document, all solvents not specified are water.

4.3 The test solution (A + B) involved in this document refers to solute A and solvent B that are

mutually miscible.

4.4 Except for "ethanol (95%)", all solutions expressed in percentage (%) in this document are

mass fractions.

4.5 The material of containers used to store preparations and products shall not physically or

chemically interact with the preparations and products.

4.7 When the preparations and products manifest turbidity, precipitation, moisture absorption

or changes in color, they shall be prepared again.

5 Preparation Methods

WARNING. some reagents used in the preparation methods are toxic or corrosive. Some test processes may lead to dangerous situations. The operator is responsible for taking appropriate safety and health measures.

5.1 Preparations

5.1.1 General preparations

5.1.1.2 Saturated hydrogen sulfide water

In the fume hood, as shown in Figure 1, connect the device. Add hydrochloric acid solution (20%) to A, and add ferrous sulfide to B. The hydrochloric acid solution (20%) is dripped from

A into B, and the generated hydrogen sulfide gas is passed into carbon dioxide-free water, until

the D solution is saturated (the mass no longer increases).

5.1.1.3 Saturated bromine water

In the fume hood, measure-take 10 mL of bromine, add it to a brown bottle filled with 75 mL of water, shake it well, and place it for stratification. The supernatant liquid is saturated bromine

water.

5.1.2 Test solution

5.1.2.1 Ammonia solution

5.1.2.1.1 Ammonia solution (2.5%)

Measure-take 103 mL of ammonia water and dilute to 1,000 mL.

5.1.2.1.2 Ammonia solution (10%)

Measure-take 400 mL of ammonia water and dilute to 1,000 mL.

5.1.2.2 Phenyl anthranilic acid-ethanol solution (1 g/L)

Weigh-take 0.1 g of phenyl anthranilic acid, dissolve it in ethanol (95%), and use ethanol (95%)

to dilute to 100 mL.

5.1.2.3 Phenylfluorone solution (0.1 g/L)

Weigh-take 0.01 g (accurate to 0.0001 g) of phenylfluorone (benzofluorenone), add an appropriate amount of ethanol (95%), warm to dissolve it; add 1 mL of hydrochloric acid solution (20%), and use ethanol (95%) to dilute to 100 mL.

5.1.2.4 Benzoylphenylhydroxylamine solution (20 g/L)

Weigh-take 2 g of benzoyl phenyl hydroxylamine (tantalum reagent), dissolve it in ethanol (95%), and use ethanol (95%) to dilute to 100 mL. The usage period is 6 months.

5.1.2.5 Benzopenttrione color developer

5.1.2.6 Ammonium pyrrolidine dithiocarbamate (APDC) solution (10 g/L)

Weigh-take 1 g of ammonium pyrrolidine dithiocarbamate (APDC), dissolve it in water, dilute

to 100 mL, if necessary, filter it.

5.1.2.40 Potassium sulfate ethanol solution (0.2 g/L)

Weigh-take 0.2 g of potassium sulfate, dissolve it in 700 mL of water and use ethanol (95%) to

dilute to 1,000 mL.

5.1.2.41 Manganese sulfate solution

Weigh-take 67 g of manganese sulfate monohydrate (manganese sulfate), dissolve it in 500 mL

of water, add 138 mL of phosphoric acid and 130 mL of sulfuric acid, and dilute to 1,000 mL.

5.1.2.42 Sodium sulfate solution (400 g/L)

Weigh-take 40 g of anhydrous sodium sulfate, dissolve it in water and dilute to 100 mL.