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

GB 12593-2007

**Working chemical - Ethylenediaminetetraacetic acid disodium
salt**

工作基准试剂 乙二胺四乙酸二钠

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Foreword

The standard Chapter 4, 5.3.1,

5.3.2 mandatory, other provisions are recommended. This standard replaces GB 12593-1990 "job reference reagent (capacity) disodium edetate," and GB 12593-1990 phase Than the main changes are as follows:

--- Standard name to "work reference reagent disodium edetate";

--- Modify the Content Measurement (before version 4.1, this version 5.3). The standard proposed by China Petroleum and Chemical Industry Association. This standard by the National Standardization Technical Committee Chemistry Chemicals Branch (SAC/TC63/SC3) centralized. This standard is drafted by: Beijing Institute of chemical reagents. Participated in the drafting of this standard. Guangdong Guanghua Chemical Factory Co., Ltd. The main drafters of this standard. Han Baoying, strong Jing Lin, Wang Yuhua, Chenhan Zhao. This standard was first published in 1977, in 1990 the first amendment. Working Standard reagent disodium edetate Molecular formula. $C_{10}H_{14}N_2O_8Na_2 \cdot 2H_2O$ Structure. $CH_2 NaO CH_2 HO CH_2 CH_2 N CH_2 OH CH_2 ONa \cdot 2H_2O$ Molecular weight. 372.24 (according to 2003 international relative atomic mass)

1 Scope

China's mandatory national standard for disodium ethylenediaminetetraacetate as a

working chemical. EDTA disodium is the reagent of complexometric titration, and the working grade is what laboratories consume in quantity: every water hardness determination, every calcium and magnesium analysis in cement, food and clinical chemistry, and the metal determinations of metallurgical control all run on it. The primary standard grade covered by GB 10734 exists to certify those solutions; this grade exists to make them. What the specification has to control is the hydration state and the free acid, because the disodium salt is normally the dihydrate and a batch that has partly dried or taken up water weighs out to a different molarity than the label implies. The standard specifies the requirements, the impurity limits, the drying conditions and the test methods.

This standard specifies the operating reference reagent

--- disodium edetate traits, specifications, testing, packaging and inspection rules and signs. This standard applies to the reference reagent titration analysis work

--- disodium edetate test.

2 Normative references

The following documents contain provisions which, through reference in this standard and become the standard terms. For dated references, subsequent Amendments (not including errata content) or revisions do not apply to this standard, however, encourage the parties to the agreement are based on research Whether the latest versions of these documents. For undated reference documents, the latest versions apply to this standard. Preparation of

GB/T 601 chemical reagent standard titration solution

GB/T 602 Determination of impurities in chemical reagents prepared standard solution (GB/T 602-2002,

ISO 6353-1. 1982, NEQ) with

GB/T 603 chemical reagent test method Preparations of articles (GB/T 603-2002,

ISO 6353-1 with. 1982, NEQ)

GB/T 6682 analytical laboratory use specifications and test methods (GB/T 6682-1992, neq ISO 3696. 1987)

GB/T 9724 General rule for determination of pH chemical reagent (GB/T 9724-2007, ISO 6353-1. 1982, NEQ)

GB/T 9728 General method for determination of chemical reagents sulfate (GB/T 9728-2007, ISO 6353-1. 1982, NEQ)

GB/T 9729 General method for determination of chloride Chemicals (GB/T 9729-2007, ISO 6353-1. 1982, NEQ)

GB/T 9735 General method for determination of heavy metals Chemicals (GB/T

9735-1988, eqv ISO 6353-1. 1982)

GB/T 9739 General method for determination of iron chemical reagents (GB/T 9739-2006, ISO 6353-1. 1982, NEQ)

GB 10738 Job reference reagent titration Determination General Weighing

GB 15346 chemical reagent packaging and marking

3 Chloride (Cl), /% ≤

0.004 Sulphate (SO₄), /% ≤

0.01 Nitrilotriacetic acid (C₆H₉NO₆), /% ≤

0.05 Iron (Fe), /% ≤ 0.0005 Copper (Cu), /% ≤ 0.00025 Heavy metals (Pb), /% ≤ 0.001

4 Specification

Disodium edetate specifications shown in Table 1. Table 1 specifications of disodium ethylenediaminetetraacetate Name reference work Content (C₁₀H₁₄N₂O₈Na₂ · 2H₂O), /% 99.95 ~ 100.05 pH value (50g/L, 25 °C) 4.0 ~

5 Test

5.1 Warning Reagents used in this test method are toxic or corrosive, some of the testing process can lead to dangerous situations, the operator should take Appropriate safety and health practices.

5.2 General Provisions Unless specified otherwise in this chapter, the use of standard titration solution, standard solution, preparations and products, according to GB/T 601, GB/T 602, Regulations preparation, test water should be consistent with GB/T 6682 specifications in three water samples according to precise weighing 0.01g, the use of GB/T 603's Solution "%" are represented by the mass fraction.

5.3 Content Measured according to GB 10738 requirements.

5.3.1 standard titration solution of zinc chloride standard titration substance disodium edetate Weigh 0.5g saturated solution of magnesium nitrate (with excess magnesium nitrate crystals) humidistat placed in standard material 7d after edetate Disodium nearest 0.00001g. Placed in a reaction flask, add 100mL of hot water to dissolve, cooling, 10mL of ammonia - ammonium chloride buffer solution A (PH value of 10), with zinc chloride standard titration solution [Ba (ZnCl₂) = 0.05mol/L] titration, add 3 drops of chrome black T indicator solution near the end (5g/L), continue titration until the solution changed from blue to red purple. Weighing disodium EDTA standard titration solution should be accurate to 0.0001g. Determination

5.3.2 Content

5.3.1 Determination of the same, instead of the standard sample material. Disodium edetate mass fraction, the value in the "%" means, according to equation (1). (1) Where. b --- standard substance disodium ethylene diamine tetra-acetic acid content (mass fraction), the value to "%" means; Determined according to the provisions of GB/T 9724's.

5.5.1 Preparation of test solution and preparation

5.5.1.1 sample solution Weigh 0.327g sample is dissolved in hot water, cooled and transferred to 100mL volumetric flask, dilute to the mark.

5.5.1.2 sodium carbonate solution Weigh 0.100g previously dried at 200 °C 2h calcium carbonate, placed in 100mL flask, add 10mL water and 0.4mL hydrochloric acid Solution (20%), was dissolved with aqueous ammonia solution (10%) and diluted to the mark.

5.5.1.3 copper sulphate solution Weigh 0.250g of copper sulfate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$), placed in 100mL volumetric flask, dissolved in water, dilute to the mark.

5.5.2 Determination 5.00mL amount of the sample solution, add 3 drops of ammonia solution (10%) and 2.5mL ammonium oxalate solution (40g/L), shaking continuously, Plus 5.00mL sodium carbonate solution, the solution should be transparent. If, after shaking 1min, the solution is still cloudy, plus 0.2mL sample solution, shake After moving 1min, transparent solution strain. Amount of sample solution 5.00mL, 0.5mL add ammonia solution (1%) and 0.5mL hexacyanoferrate (II) solution of potassium (100g/L), Constantly shaking plus 4.8mL copper sulfate solution, the solution should be bluish green, not a red.

5.6 Clarity test Weigh 5g sample was dissolved in 100mL of water. Turbidity is not greater than HG/T 3484 standard stipulated clarity 3.

5.7 Chloride Weigh 0.5g sample was dissolved in 10mL water, add 2mL solution of nitric acid (25%), and shaken until complete precipitation of the precipitation, filtration, water Washed three times, the combined filtrate and washings were diluted to 20mL, determined according to the provisions of GB/T 9729's. The turbidity of the solution was not greater than the standard ratio Turbid solution. Standard preparation turbid solution is to take the ratio of 0.02mg containing chloride (Cl) standard solution was diluted to 20mL, and at the same time with the same volume of test solution Sample processing.

5.8.1 Preparation of test solution I Weigh 3g sample placed in a platinum dish, slowly heating carbonization burning to white at 600 °C. If necessary, add 5mL water, evaporated to dryness, and then at 600 °C burning, iterative process until the residue completely white. Add water 20mL, 6mL solution of nitric acid solution (25%), evaporated on a water bath. Residue Dissolved in hot water, cooled and diluted to 30 mL (filtered if necessary).

5.8.2 Determination Amount of test solution 5mL I (5.8.1), diluted to 20mL, determined