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

GB/T 12028-2026

Replacing GB/T 12028-2006

Sodium carboxymethylcellulose for detergents

洗涤剂用羧甲基纤维素钠

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents". Drafting. This document replaces GB/T 12028-2006 "Sodium Carboxymethyl Cellulose for Detergents". Compared with GB/T 12028-2006, except for the structure... Aside from adjustments and editorial changes, the main technical changes are as follows:

- The methods for determining moisture and volatile matter have been revised (see 5.3, 4.1 in the 2006 edition);
- The method for measuring viscosity has been changed (see 5.4, 4.2 in the 2006 edition);

---The method for pH determination has been changed (see 5.5, 4.3 in the.2006 edition);

---The method for determining the degree of etherification has been changed (see 5.6, 4.4 in the.2006 edition);

---The method for determining the active ingredient has been changed (see 5.7, 4.5 in the.2006 edition);

---The methods for determining the total content of several inorganic salts have been revised (see 5.8, 4.6 in the.2006 edition);

4 Requirements

4.1 Appearance White to slightly yellow fibrous powder or granules.

4.2 Purity When iodine solution is added to the sample solution, the solution should not turn blue.

4.3 Physicochemical Indicators The physicochemical properties of the product should meet the requirements of Table

1.Sodium carboxymethyl cellulose products used in the dry-mixing method for producing laundry detergent should also meet the following requirements. The sieving rate is not less than 95% when passing through a 0.45mm sieve, and all of them can pass through a 0.80mm sieve.

5 Test Methods

5.1 Appearance The appearance shall be measured in accordance with the requirements of GB/T 13173.

5.2 Purity

5.2.1 Reagents Unless otherwise specified, only reagents confirmed to be of analytical grade shall be used in the analysis; the water used in the tests shall comply with the requirements of GB/T 6682.Reagents as follows:

a) Potassium iodide (KI);

5.2.2 Procedure Weigh

3.6 g of potassium iodide [5.2.1a)], dissolve it in 20 mL of water, add

1.3 g of iodine [5.2.1b)], dissolve it, and then dilute it with water to the specified

concentration. 100 mL. This solution is an iodine test solution. Add 50 mL of water to 0.5 g of sample to dissolve and obtain the sample solution. Take 5 mL of the sample solution, add 1 drop of iodine test solution, and observe the sample. The solution color changes.

5.3 Moisture and volatile matter The moisture and volatile matter content were determined according to the specifications in GB/T 13173. The test sample weighed 4g, and the weighing bottle specifications were as follows: $\phi 60\text{mm} \times 25\text{mm}$.

5.4 Viscosity

5.4.1 Principle The viscosity of a sodium carboxymethyl cellulose solution was determined using a prescribed rotational viscometer. The viscosity of the solution is related to the rotation of the cylinder of the rotational viscometer in the solution. The shear stress generated by rotation is a function of the applied shear rate.

5.4.2 Reagents Unless otherwise specified, only reagents confirmed to be of analytical grade shall be used in the analysis; the water used in the test shall comply with the requirements of GB/T 6682.

5.4.3 Instruments The required experimental equipment is as follows:

- a) A rotational viscometer with a measuring range of 5 mPa·s to 50 mPa·s and a shear rate of 850 s^{-1} ;
- b) Super constant temperature water bath, capable of maintaining the temperature at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$;
- c) Volumetric flask, 100 mL;
- d) Beaker, 100mL.

5.4.4 Procedure The test procedure includes...

a) Preparation of the test solution. Weigh approximately 1 g of the sample (accurate to 0.001

g) (on a dry basis) into a beaker [5.4.3d], add water and stir vigorously to make it flowable. Transfer the turbid solution to a 100 mL volumetric flask [5.4.3c). Rinse the beaker [5.4.3d] and glass rod with a small amount of water each time. Next, add the rinsing solution to the volumetric flask and shake vigorously for 15 minutes.

b) Measurement. Place the test solution [5.4.4a)] in a constant temperature water bath [5.4.3b)] at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ for 20 minutes, then remove and dilute with water to the specified concentration. Shake vigorously for 1 minute. Then place in a constant temperature water bath for 10 minutes, remove and shake well. Select a measurement range of [range to be specified]. For a rotating drum with a pressure of 5 mPa·s to 50 mPa·s [5.4.3a], after wetting

and rinsing the rotating drum and measuring container with a small amount of test solution, proceed according to the viscometer... [5.4.3a)] Use the instructions to determine the viscosity of the test solution. Start reading the value 30 seconds after the pointer stabilizes during rotation of the rotating drum, and then repeat every 10 seconds thereafter. Read the value once, until you get five consecutive unchanging readings.

5.4.5 Result Calculation The viscosity (η) of the sample solution is calculated according to formula (1).

5.4.6 Precision The difference between two independent measurements obtained under repeatability conditions should not exceed 5% of the average value, and in cases where it exceeds 5%, it should not exceed [a certain percentage]. The premise is 5%.

5.6 Degree of etherification

5.6.1 Principle The water-soluble sodium carboxymethyl cellulose was acidified to become insoluble acid carboxymethyl cellulose. After purification, it was treated with an accurately measured amount of excess hydroxide. Sodium chloride is used to convert a known amount of acidic carboxymethyl cellulose back into sodium salt, and then the excess alkali is titrated with a standard hydrochloric acid solution.

5.6.2 Reagents Unless otherwise specified, only reagents confirmed to be of analytical grade shall be used in the analysis; the water used in the tests shall comply with the requirements of GB/T 6682. Reagents as follows:

- a) 95% ethanol ($\text{CH}_3\text{CH}_2\text{OH}$);
- b) Ethanol ($\text{CH}_3\text{CH}_2\text{OH}$), 80% solution. Dilute 840 mL of 95% ethanol [5.6.2a)] with water to 1 L;
- c) Anhydrous methanol (CH_3OH);
- d) Nitric acid (HNO_3);
- e) Hydrochloric acid (HCl) standard titration solution, $c(\text{HCl}) = 0.4 \text{ mol/L}$, prepared and standardized according to QB/T 2739;
- f) Sodium hydroxide (NaOH) standard titration solution, $c(\text{NaOH}) = 0.4 \text{ mol/L}$, prepared and standardized according to QB/T 2739;
- g) Sulfuric acid (H_2SO_4) solution, prepared according to a volume ratio of concentrated sulfuric acid to water of 9.2;
- h) Diphenylamine ($\text{C}_{12}\text{H}_{11}\text{N}$) reagent. Dissolve 0.5 g of diphenylamine in 120 mL of sulfuric acid solution [5-6.2 g). This reagent should be colorless and react with sulfuric acid. It turns deep blue when