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

GB/T 9104-2008

Test methods for industrial stearic acids

工业硬脂酸试验方法

(English Translation)

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1 Scope

This Standard specifies test methods for industrial stearic acids, including determination methods for iodine value, saponification value, acid value, color, titer, water, inorganic acid, ash, composition.

This Standard is applicable to the determination of industrial stearic acids (the main components are octadecanoic acid and palmitic acid) that are produced and refined by animal or vegetable oils through hydrolysis or distillation.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrigendum) or revisions do not apply to this Standard, however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable.

For undated references, the latest edition of the referenced document applies.

QB/T 2739-2005, Preparations of standard volumetric solutions of general test methods for washing products

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 Iodine value

halogen absorbed by 100g of stearic acid sample, expressed in equivalent amount of iodine

3.2 saponification value under the specified test conditions, the number of milligrams of potassium hydroxide consumed to saponify 1g of stearic acid sample

3.3 acid value the number of milligrams of potassium hydroxide consumed to neutralize 1g of stearic acid sample

4.2.8 Starch indicator solution (10g/L): is prepared according to 5.3 in QB/T 2739-2005.

4.2.9 Sodium thiosulfate (GB/T 601), $c(\text{Na}_2\text{S}_2\text{O}_3) = 0.1\text{mol/L}$ standard titration solution, is prepared and calibrated according to 4.12 in QB/T 2739-2005.

4.2.10 Iodine chloride solution (Wijs solution): dissolve 13g of iodine (4.2.6) in

1000mL of acetic acid (4.2.1) (slightly heat while dissolving). Then place in a 1000mL brown bottle. After cooling, pour 100mL~200mL into another brown bottle. Place in a dark place for adjustment use. Make chlorine (4.2.7) access to the remaining 800mL~900mL of iodine solution until the solution gradually fades from a dark color till it appears orange and transparent. After the access amount of chlorine is corrected according to the correction method, use the preserved iodine solution to adjust.

Correction method: Respectively take 25.0mL of iodine solution and the freshly- prepared Wijs solution. Respectively add 20mL of potassium iodide solution (4.2.2). Then respectively add 100mL of distilled water. Use 0.1mol/L sodium thiosulfate standard titration solution (4.2.9) to titrate the solution. When it appears light yellow, add 1mL of starch indicator (4.2.8) to continue titrating until blue disappears. The volume of sodium thiosulfate standard titration solution consumed by freshly-prepared Wijs solution shall be close to twice iodine solution's volume.

4.3 Apparatus

Common laboratory apparatus and

4.3.1

Iodometric flask

250mL.

4.3.2

Plugged burette

25mL, brown.

4.3.3

Volumetric flask

1000mL, brown.

4.3.4

Pipette

10mL, 25mL.

4.4 Test procedures

Weigh 2g~3g of dry sample (to the nearest of 0.001g; according to the level of iodine price, the weighing can be increased or decreased) in the iodometric flask (4.3.1). Add 20mL of cyclohexane-acetic acid solution (4.2.4). After the sample is dissolved, use pipette (4.3.4) to add 25.0mL of Wijs solution (4.2.10).

Completely shake well and place at a dark place around 25°C to store for 30min.

Then take the iodometric flask out from the dark place. Add 20mL of potassium iodide solution (4.2.2). Then add 100mL of distilled water. Use sodium thiosulfate standard titration solution (4.2.9) to titrate. Perform titration while shaking till the solution appears light yellow. Add 1mL of starch indicator solution

5.2 Apparatus

Common laboratory apparatus and

5.2.1

Erlenmeyer flask

250mL.

5.2.2

Plugged burette

50mL.

5.2.3

Constant-temperature water bath or hot plate.

5.3 Test procedures

Weigh 2g of specimen (to the nearest of 0.001g) in the Erlenmeyer flask (5.2.1).

Use pipette to add 50.0mL of potassium hydroxide ethanol solution (5.1.1).

Then install a reflux condenser. Place in water bath or hot plate (5.2.3) to maintain the slight boiling state for 1h. Do not allow vapor to escape from the condenser. After removing, add 6 drops of phenolphthalein indicator solution (5.1.3). While it is still hot, use hydrochloric acid standard titration solution (5.1.2) to titrate till red just disappears. Conduct the blank test at the same time.

5.4 Result calculation

5.4.1

The saponification value of stearic acid (SV) is expressed in milligrams per gram (mg/g). It is calculated according to formula (2):

Where,

V₂ - Volume of hydrochloric acid standard titration solution consumed by blank test, in milliliters (mL);

V₁ - Volume of hydrochloric acid standard titration solution consumed by test portion, in milliliters (mL);

c - Concentration of hydrochloric acid standard titration solution, in Moles per liter (mol/L);

56.1 - Molar mass of potassium hydroxide expressed by grams in test, in grams per millimoles (g/mmol);

m - Mass of test portion, in grams.

Use the arithmetic mean of the results of two parallel measurements to indicate to one digit after the decimal point as the determination result.

5.4.2 Precision: The absolute difference between two independent test results

per liter (mol/L);

56.1 - Molar mass of potassium hydroxide expressed by grams in test, in grams per millimoles (g/mmol);

m - Mass of test portion, in grams (g).

Use the arithmetic mean of the results of two parallel measurements to indicate one digit after decimal place, as determination result.

6.4.2 Precision: The absolute difference between two independent test results

obtained under repetitive conditions is not more than 0.5mg/g. The premise is that the situation greater than 0.5mg/g does not exceed 5%.