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

GB/T 5530-2005

**Animal and vegetable fats and oils -- Determination of acid
value and acidity
(English Translation)**

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1 Scope

This standard specifies the methods for determining the acidity in animal and vegetable oils and fats (two titration methods and one potentiometer method); the acidity is usually expressed as acid value. The hot ethanol determination method in this standard is the reference method. The cold solvent method is applicable to light-colored oils and fats.

This standard does not apply to waxes.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For the dated references, the subsequent amendments (excluding corrections) 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.

GB/T 6682-1992 Water for analytical laboratory use - Specification and test methods (neq ISO 3696:1987)

GB/T 15687 Oils and fats - Preparation of test sample (GB/T 15687-1995, eqv ISO 661:1989)

3 Terms and definitions

The following terms and definitions apply to this standard.

3.1

Acid value

The number of milligrams of potassium hydroxide required to neutralize the free fatty acids in 1 gram of oil and fat, as determined by the method specified in this standard, expressed in milligrams per gram.

3.2

Acidity

The free fatty acid content determined by the method specified in this standard, expressed in mass fraction.

Note 1: When the result is written as "acidity" without detailed description, this "acidity" is usually expressed in terms of oleic acid.

Note 2: When the sample contains mineral acids, fatty acids are usually determined.

4.1 General

This method is a reference method for the determination of the acid value of fats (see Chapter 1).

Note 3: Under the conditions specified in this method, short-chain fatty acids are volatile.

4.2 Principle

The specimen is dissolved in hot ethanol and titrated with sodium hydroxide or potassium hydroxide aqueous solution.

4.3 Reagents

Unless otherwise specified, only reagents confirmed as analytically pure are used. The water used shall meet the requirements of grade-3 water in GB/T 6682-1992.

4.3.1

Ethanol

The minimum concentration is 95%.

4.3.2 Sodium hydroxide or potassium hydroxide: The concentration of the standard

solution is $c(\text{NaOH or KOH}) = 0.1 \text{ mol/L}$.

4.3.3 Sodium hydroxide or potassium hydroxide: The concentration of the standard

solution is $c(\text{NaOH or KOH}) = 0.5 \text{ mol/L}$.

4.3.4 Phenolphthalein indicator: 10 g/L; 10 g of phenolphthalein is dissolved in 1 L of 95% ethanol solution.

Note 4: When measuring darker samples, add 1 mL of 0.1% methylene blue solution to every 100 mL of phenolphthalein indicator solution, to observe the titration endpoint.

4.3.5 Basic blue 6B or thymolphthalein (for dark oils and fats): 20 g/L; 20 g of basic (4.3.2),

until the solution changes color. Keep the solution unchanged for 15 s, which is the end point.

Note 6: When the color of the oil is dark, more ethanol and indicator need to be added.

Transfer the neutralized ethanol to the conical flask containing the test sample; mix thoroughly; boil. Titrate with sodium hydroxide or potassium hydroxide standard solution (4.3.2 or 4.3.3 depends on the estimated acid value of the sample); shake thoroughly during the titration process. When the solution changes color and remains unfaded for 15 seconds, the titration end point is reached.

5.1 General

This method is applicable to light-colored oils and fats.

5.2 Principle

The sample is dissolved in a mixed solvent and titrated with potassium hydroxide ethanol solution.

5.3 Reagents

Unless otherwise specified, only reagents confirmed to be analytically pure are used.

The water used shall meet the requirements of grade-3 water in GB/T 6682-1992.

5.3.1

Ether and 95% ethanol

1 + 1 volume mixture.

Warning: Ether is highly flammable and can generate explosive peroxides. It must be used with extreme caution.

Before use, add 0.3 mL of phenolphthalein solution (5.3.3) to every 100 mL of mixed solvent; accurately neutralize with potassium hydroxide ethanol solution (5.3.2) (see note in 4.7.2).

If it is not possible to use ether, the following mixed solvents can be used:

- Toluene and 95% ethanol, 1+1 volume mixture;
- Toluene and 99% isopropanol, 1+1 volume mixture;
- When determining crude oil and refined vegetable fats, 99% isopropanol can be used instead of the mixed solvent.

ethanol, 8 g of potassium hydroxide, 0.5 g of aluminum flakes; boil and reflux for 1 h; then immediately distill; dissolve the required amount of potassium hydroxide in the