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JIS

JAPANESE INDUSTRIAL STANDARD

Test methods for acid value, saponification value, ester value, iodine value, hydroxyl value and unsaponifiable matter of chemical products

JIS K 0070—1992

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In the event of any doubt arising,
the original Standard in Japanese is to be final authority.

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Test methods for acid value, saponification value, ester value, iodine value, hydroxyl value and unsaponifiable matter of chemical products

K 0070-1992

1. Scope This Japanese Industrial Standard mainly specifies the general test methods for acid value, saponification value, ester value, iodine value, hydroxyl value and unsaponifiable matter of oil-and-fat products, its derivatives, and chemical products which contains these materials.

Remarks 1. The chemical products mentioned here mean all products prepared through chemical reaction, however, when measuring methods other than these methods are prescribed in the standard for other individual product or group of products, the test should conform to the method in the standard.

2. The standards cited in this Standard are shown in Attached Table 1.

2. General matters

2.1 Definition of terms The definition of terms used in this Standard shall be as follows in addition to those in JIS K 0050 and JIS K 0211.

(1) Acid value Acid value means the numbers of mg-weighed mass of potassium hydroxide required to neutralize such as free fatty acid or resin acid contained in 1 g of the sample.

(2) Saponification value Saponification value means the number of mg-weighed mass of potassium hydroxide required to completely saponify 1 g of the sample.

(3) Ester value Ester value means the number of mg-weighed mass of potassium hydroxide required to completely saponify ester contained in 1 g of the sample.

(4) Iodine value Iodine value means the number of mg-weighed mass of iodine corresponding to the amount of halogen required when 100 g of the sample is halogenized.

(5) Hydroxyl value Hydroxyl vlaue means the number of mg-weighed mass of potassium hydroxide required to neutralize acetic acid which combines with hydroxyl group when 1 g of the sample has been acetylated.

(6) Unsaponifiable matter Unsaponifiable matter means the percentage ratio of the substance extracted by diethyl ether, after the sample has been saponified, to the mass of the sample.

2.2 Matters in common The matters in common to the test shall follow the description in JIS K 0050 and JIS K 0113, and glassware follow JIS R 3503. Rounding-off of numerical values follow JIS Z 8401.

3. Acid value Testing methods are grouped into neutralization titrimetry and potentiometric titrimetry.

Remarks: If potentiometric titrimetry gives some different measurement, adopt neutralization titrimetry.

3.1 Neutralization titrimetry

(1) Summary Dissolve the sample in solvent, add phenolphthalein as an indicator, titrate it with potassium-hydroxide ethanol solution to find acid value.

(2) Reagents Reagents shall be as follows.

(a) 0.1 mol/*l* hydrochloric acid Follow 4.5 (5.5) [0.1 mol/*l* hydrochloric acid (3.646 g HCl/*l*)] in JIS K 8001.

(b) 0.1 mol/*l* potassium-hydroxide ethanol solution Dissolve 7 g of potassium hydroxide specified in JIS K 8574 in 5 ml water, add ethanol (95) specified in JIS K 8102 to make total 1 *l*, let it stand for 2 to 3 days excluding carbon dioxide, and keep supernatant solution or filtered solution in an alkali-resistant bottle.

Standardization shall be done as follows: Place 25 ml of 0.1 mol/*l* hydrochloric acid into an Erlenmeyer flask using a transfer pipet, add phenolphthalein solution, titrate it with 0.1 mol/*l* potassium-hydroxide ethanol solution, and find the factor from the volume required at titration.

(c) Phenolphthalein solution Follow 4.3 of JIS K 8001.

(d) Solvent Mix diethyl ether specified in JIS K 8103 and ethanol (99.5) specified in JIS K 8101 at the volumetric ratio of 1 : 1 or 2 : 1 ([1]).

These shall be, immediately before to be used, neutralized with 0.1 mol/*l* potassium-hydroxide ethanol solution with adding several drops of phenolphthalein solution as indicator.

Note ([1]) In case of the sample hardly soluble in solvent, use the solvent having high compounding ratio of diethyl ether. Instead of ethanol of solvent, 2-propanol specified in JIS K 8839 can be used.

(3) Equipment and apparatus Equipment and apparatus shall be as follows.

(a) Erlenmeyer flask 300 ml

(b) Buret 25 ml

(c) Water bath or hot plate

(4) Operations Operations shall be carried out as follows.

(a) Weigh the sample in an Erlenmeyer flask as shown in Table 1.

(b) Add 100 ml solvent and several drops of phenolphthalein as indicator, and stir them on a water bath to make the sample dissolve completely.