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Naphthalene for industrial use

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Contents

	Page
Introduction.....	1
1 Scope.....	1
2 Normative references	1
3 Classification	1
4 Quality	2
5 Test method.....	2
5.1 General matters	2
5.2 Sampling and preparation of sample	2
5.3 Solidifying point	3
5.4 Purity	4
5.5 Impurities	5
5.6 Sulfuric acid colouring test method.....	10
5.7 Nonvolatile matter content	11
5.8 Determination method for moisture content	13
6 Inspection	13
7 Marking.....	14
Annex A (normative) Sampling method.....	15

Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry, through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by The Japan Aromatic Industry Association, Inc. (JAIA)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS K 2436**:1990 is replaced with this Standard.

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Naphthalene for industrial use

Introduction

This Japanese Industrial Standard has been revised for the purpose of avoiding the duplication of standard and the like by quoting the Japanese Industrial Standards as much as possible relating to the general test methods common to chemical products as well as the deletion of specifications relating to anthracene and carbazole from the former standard.

The corresponding International Standard has not yet been established at this point.

1 Scope

This Standard specifies naphthalene for industrial use.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS C 3105 *Hard-drawn copper stranded conductors*

JIS K 0050 *General rules for chemical analysis*

JIS K 0068 *Test methods for water content of chemical products*

JIS K 0114 *General rules for gas chromatographic analysis*

JIS K 2435-1 *Benzene • Toluene • Xylene—Part 1: Benzene*

JIS K 8040 *Acetone for pesticide residue and polychlorinated biphenyl analysis (Reagent)*

JIS K 8125 *Calcium chloride (for U-tube) (Reagent)*

JIS K 8279 *Quinoline (Reagent)*

JIS K 8305 *meta-Cresol (Reagent)*

JIS K 8552 *Cobalt (II) nitrate hexahydrate (Reagent)*

JIS K 8798 *Phenol (Reagent)*

JIS K 8949 *Sodium sulfide nonahydrate (Reagent)*

JIS K 8951 *Sulfuric acid (Reagent)*

JIS M 8100 *Particulate materials—General rules for methods of sampling*

JIS Z 8401 *Guide to the rounding of numbers*

3 Classification

Naphthalene for industrial use shall be classified into refined naphthalene and 95 % naphthalene.

4 Quality

Quality shall be divided according to the classification. When tested according to clause 5, the quality shall be in accordance with table 1.

Table 1 Quality

Item \ Classification	Refined naphthalene	95 % naphthalene
Solidifying point °C	79.5 min.	77.5 min. (for dehydrated sample)
Purity % (mass fraction)	99 min.	95 min. (for dehydrated sample)
Impurities	Comply with the agreement between the interested parties	Comply with the agreement between the interested parties
Sulfuric acid colouring test	To be not darker than colorimetric reference solution No. 2	—
Nonvolatile matter content % (mass fraction)	—	0.2 max.
Moisture content % (mass fraction)	—	0.2 max.

5 Test method

5.1 General matters

General matters shall be in accordance with **JIS K 0050**, however, the following are added.

- Substance which is simply described as solution without indicating especially solvent, always means aqueous solution.
- When a scale is read by the surface of liquid, it shall be read at the bottom fringe of the surface of the liquid raised by surface tension.
- A thermometer which has been preliminarily calibrated with the standard thermometer shall be used.

5.2 Sampling and preparation of sample

5.2.1 Sampling

The sampling shall be in accordance with Annex A.

5.2.2 Preparation of sample

The preparation of sample shall be as follows.

- Take about 100 g of representative sample, grind with a mortar, and sufficiently mix to make the sample uniform. Apply the uniform sample to a test.
- Take 50 g of a) into a 100 ml beaker, fuse it by heating at about 85 °C, put 10 g of calcium chloride specified in **JIS K 8125**, and stir for a while with keeping at a temperature of about 85 °C. After allow to stand still for 5 min to 10 min, remove the supernatant liquid and take it as a dehydrated sample.

5.3 Solidifying point

5.3.1 Summary

Take the sample into a test tube, cool quietly with stirring in a water bath at a temperature lower than an estimated solidifying point of the sample, and measure the highest temperature when the sample is solidified.

5.3.2 Solidifying point of refined naphthalene

5.3.2.1 Apparatus and instrument

The apparatus and instrument shall be as follows.

- Apparatus** In accordance with figure 1.
- Test tube** Borosilicate glass. The shape and dimensions shall be in accordance with figure 1.
- Thermometer** In accordance with table 9 in 5.10.2 b) of JIS K 2435-1.
- Stirring rod** A wire about 1 mm in diameter of which the tip is made round.
- Large size test tube** The shape and dimensions shall be in accordance with figure 1.
- Beaker** Of 1 000 ml in capacity as shown in figure 1.

Unit: mm

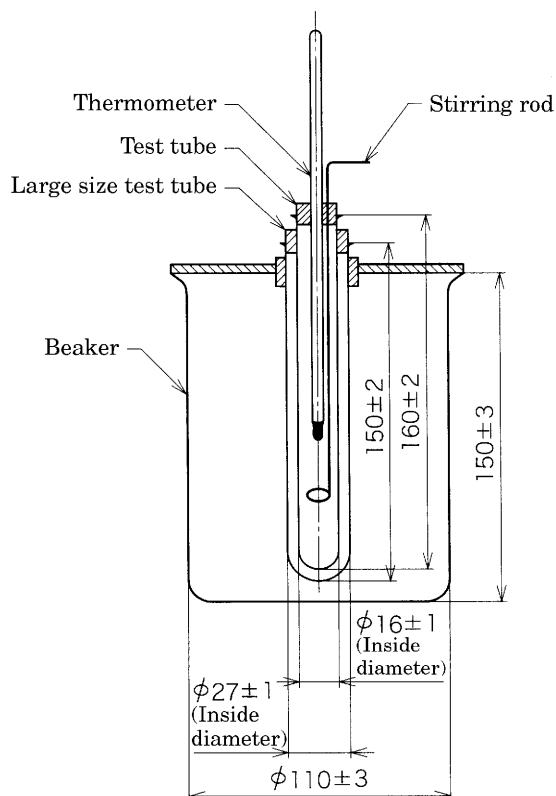


Figure 1 Apparatus for measurement of solidifying point

5.3.2.2 Operation

Operations shall be as follows.

- a) Fuse the sample into liquid, take about 25 ml to a test tube, fit a cork stopper through which a thermometer and a stirring rod are inserted while the sample is being kept liquid at a temperature of 90 °C or over. Regulate the mercury bulb of the thermometer so that it is located at the centre of the sample in a test tube as shown in figure 1.
- b) After fitting a large size test tube thereto as an outer casing, insert it into a beaker filled with warm water at about 75 °C, and cool with stirring it at a rate of one time for 2 s.
- c) At the same time when the sample starts solidifying, the indication of the thermometer starts rising. When all is ended to be solidified, rise of temperature stops, and the temperature starts to descend again. Take this highest indication of the thermometer as a solidifying point. However, temperature correction of the exposed part of the thermometer is not performed.

5.3.3 Solidifying point of 95 % naphthalene

Use a dehydrated sample, make a warm water temperature about 73 °C, and perform the measurement according to the method specified in 5.3.2.

5.4 Purity

Obtain the purity of refined naphthalene and 95 % naphthalene from the solidifying point measured in accordance with 5.3 by using table 2.

Table 2 Relation between solidifying point and purity of naphthalene

Solidifying point °C	Purity % (mass fraction)	Solidifying point °C	Purity % (mass fraction)	Solidifying point °C	Purity % (mass fraction)
75.0	90.0	77.0	94.0	79.0	98.0
75.1	90.2	77.1	94.2	79.1	98.2
75.2	90.4	77.2	94.4	79.2	98.4
75.3	90.6	77.3	94.6	79.3	98.6
75.4	90.8	77.4	94.8	79.4	98.8
75.5	91.0	77.5	95.0	79.5	99.0
75.6	91.2	77.6	95.2	79.6	99.2
75.7	91.4	77.7	95.4	79.7	99.4
75.8	91.6	77.8	95.6	79.8	99.5
75.9	91.8	77.9	95.8	79.9	99.6
76.0	92.0	78.0	96.0	80.0	99.7
76.1	92.2	78.1	96.2	80.1	99.8
76.2	92.4	78.2	96.4	80.2	99.9
76.3	92.6	78.3	96.6	80.3	100.0
76.4	92.8	78.4	96.8		
76.5	93.0	78.5	97.0		
76.6	93.2	78.6	97.2		
76.7	93.4	78.7	97.4		
76.8	93.6	78.8	97.6		
76.9	93.8	78.9	97.8		

5.5 Impurities

5.5.1 Summary

The contents of impurities contained in refined naphthalene and 95 % naphthalene shall be obtained by the gas chromatography method.

General matters common to the method shall be in accordance with **JIS K 0114**.

5.5.2 Apparatus and instrument

The apparatus and instrument shall be as follows.

a) Gas chromatograph

- 1) **Detector** A flame ionization detector. When the sample is introduced, low boiling point components are sufficiently separated to be eluted, and a peak height of a component of which the mass fraction is 0.01 % or over shall be two times that of a noise level or over.
- 2) **Tube for column** A borosilicate glass tube or a stainless steel tube of 3 mm in inside diameter and 3 m in length.
- 3) **Column** A column in which the column packing which carries the reagent for the column packing [see **5.5.3 b**] in carries [see **5.5.3 a**] as that the carrying rate specified in **JIS K 0114** becomes 5 % (mass fraction), is packed in the tube for column [see **5.5.2 a** 2)] or the one at least equivalent to it.

For the column, the products on the market packed with packing shall be used. When the packed column is personally made and used for measurement, it shall be in accordance with **7.2 e)** of **JIS K 0114**.

- 4) **Sample introducing part** Equipped with a liquid sample introducing part and carburetor.
- b) **Chemical balance** Capable of weighing to the nearest 0.1 mg.
- c) **Microsyringe** Of 1 μl to 10 μl .
- d) **Data processor**

5.5.3 Carrier, reagents, and carrier gas

The carrier, reagents and carrier gas shall be as follows.

- a) **Carrier** Refractory brick of 150 μm to 180 μm in grain size (in which diatomaceous earth is made to be the main composition and the fire resistance temperature is about 1 100 °C) or the one equivalent to it.

NOTE : There are Uniport, Celite 545, etc. for the carrier on the market.

- b) **Stationary liquid** Polyester (alkylene glycol phthalate ester)

NOTE : There are Thermon-3000, etc. for the column packing on the market.

- c) **Reagent for preparation**

- 1) **Acetone** Of concentration 300 specified in **JIS K 8040** or the one equivalent to it.

- d) **Reagent for calibration** The reagent for calibration shall be as follows. The one without hindrance to test, except for those specified in **JIS**, shall be used.

- 1) Indan
- 2) Indene
- 3) Acetophenone
- 4) Propiophenone
- 5) Benzothiophene
- 6) 2-methylnaphthalene
- 7) 1-methylnaphthalene
- 8) Quinoline (as specified in **JIS K 8279**)
- 9) 2,3-dimethylnaphthalene
- 10) Phenol (as specified in **JIS K 8798**)
- 11) *m*-cresol (as specified in **JIS K 8305**)
- 12) 2,3-xyleneol
- 13) 3,5-xyleneol
- 14) 3,4-xyleneol
- 15) Fluorene (internal standard substance)