

# KS

## KOREAN INDUSTRIAL STANDARD

Test methods for refractive index of  
chemical products

**KS M 0005 : 1997**

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the original standard in Korean is to be evidence.

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## Test methods for refractive index of chemical products

## 1. Scope

This standard specifies about general method to measure refractive index of chemical products.

- Remarks**
1. Chemical products indicate whole materials that are created by chemical reactions, but it follows the specified method in the standard in case the measurement method that is different from the standard of individual product or product group is specified.
  2. There are some chemical products that can't secure safety of test because volatility, explosiveness, radioactivity and etc are strong. Specified method in this standard is general method. Apply what can confirm the safety enough previously.
  3. Because the refractive index of chemical products uses sodium spectrum D usually, represent by  $n_D^{20}$  for air at 20 °C.
  4. Sample must be homogeneous and transparent liquid or solid, and satisfy the specified condition by the measurement method.
  5. This standard specifies the method to yield the value of the refractive index with accuracy of  $\pm 0.0002$ .

## 2. Quoted standard

The standard composes some of regulation of this standard by being quoted in this standard. This quoted standard applies the current edition.

**KS A 0021** Rules for rounding of numerical values

**KS A 3012** Glossary of optical terms

**KS M 0126** Technical terms for analytical chemistry (general part)

## 3. General contents

## 3.1 Definitions

The definitions of main terminology used in this standard follow **KS A 3012** and **KS M 0126**, and following contents.

## a) refractive index

Ratio between sine value of incidence angle  $\alpha$  in refraction phenomenon that occurs in the interface when the light comes into some material in air, and ratio in the sine value of refractive angle  $\beta$

$$n = \frac{\sin \alpha}{\sin \beta}$$

where     $n$ : refractive index  
            $\alpha$ : incidence angle  
            $\beta$ : refractive angle

"In the air" is the place that air of the atmospheric pressure is in existence, and uses D (589.3nm) line of sodium as the light for measurement. Because the refractive index changes according to wavelength and temperature of the projected light, it is described as  $n_D^t$ .  $T$  indicates measurement temperature(°C), and  $D$  indicates D line.

#### b) refractometer

Apparatus that measures liquid and solid refractive index

There are Abe refractometer, Pulpeurihi refractometer, digital refractometer and etc.

Also, use of Abe refractometer is basis in this standard.

#### c) white light source

An incandescent lamp that is lighted up in the specified voltage

#### d) color removing apparatus

Structure including the prism(so called Amiti prism) designed to correct progress direction of wave length dispersed light for progress direction of all sodium D by refraction. The measurement value of D can be obtained by interweaving to Abe refractometer and using white source of light.

#### e) double refraction

When light is projected to materials that have optical double direction property, that is liquid crystal, crystal, laminated film and so on, what shows 2 refraction lights that express different refractive index according to the direction.

#### f) specimen

Standard glass that is incused by refractive index to correct the refractometer

### 3.2 Common contents

#### 3.2.1 Measurement environment and measurement condition

- a) Measurement environment sets by temperature  $20 \pm 5^{\circ}\text{C}$ , humidity  $(65 \pm 20) \%$ .
- b) The measurement temperature of liquid sample is  $20.0 \pm 0.2^{\circ}\text{C}^{(1)}$ , the measurement temperature of film or resin is  $20 \pm 2^{\circ}\text{C}^{(1)}$ , and the measurement temperature of other solid sample is  $20 \pm 5^{\circ}\text{C}^{(1)}$ .
- c) Write the temperature when it is measured along with the refractive index for the sample that can not be measured in a) and b).

**Footnote<sup>(1)</sup>** When the sample with known temperature correction factor is measured, the temperature may not be set by  $20^{\circ}\text{C}$  necessarily.

#### 3.2.2 Treatment of sample

Following sample must be handled attentively.

- a) If the sample changes easily when being exposed to gas (mainly air) or the sample is hygroscopic or volatile, operate fast or use a syringe when collecting the sample and inject the sample between main and sub prisms.
- b) If the sample changes according to light, measure in the darkroom or a place in which light with the influenced wavelength is intercepted.
- c) Measurement accuracy is influenced greatly by homogeneity, shape and state of surface in solid. It shall be considered in case of the sample that is not fit to the measurement condition of this standard.

#### 3.2.3 Standard material and calibration of apparatus

Calibrate by using distilled water or attachment specimen<sup>(2)</sup> when necessary.

- a) Follow by 5. in case of use distilled water, and follow by 6. in case of the test glass when calibrating.
- b) Calibration shall be done necessarily when the measurement environment is changed greatly or received physical impact. Usually measure water and confirm it, before measuring.
- c) Completion method of numerical value follows KS A 0021.