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Chemical reagent - General method for the determination of refractive index

化学试剂　折光率测定通用方法

(ISO 6353-1:1982, Reagents for chemical analysis – Part 1: General test methods, NEQ)

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Chemical reagent - General method for the determination of refractive index

1 Scope

This document specifies the general method for measuring the refractive index of liquid organic reagents by the Abbe refractometer method or the automatic digital display refractometer method.

This document is suitable for the determination of light-colored and transparent liquid organic reagents with a refractive index ranging from 1.3000 to 1.7000. The automatic digital display refractometer method in this document is also suitable for the determination of dark, translucent and opaque liquid organic reagents.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) is applicable to this standard.

GB/T 6682 Water for analytical laboratory use -- Specification and test methods

JJG 625 Verification regulation of abbe refractometer

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Refractive index

Under the conditions of the sodium spectrum D line and 20 °C, the ratio of the speed of light in the air to the speed of light in the test object; or when the light passes through the test object from the air, the ratio of the sine of the incident angle to the sine of the refraction angle.

6.2.2 Use the grade 2 water or working sample to calibrate the Abbe refractometer. Under the conditions of the sodium spectrum D line and 20 °C, the refractive index of the grade 2 water is n=1.3330. The refractive index of the working sample and the calibration method of the instrument refer to the instruction manual.

6.2.3 Before the measurement, it shall clean the surface of the prism. It may use ethanol, ether or a mixture of ethanol and ether to clean; then use lens paper or medical cotton to absorb-dry the solvent.

6.2.4 Use a dropper to add a few drops of the sample that is at about 20 °C to the surface of the prism; immediately, close the prism and tighten it. The sample shall be uniform, without bubbles and fully fill the field of view; wait for the reading of the thermometer of the prism to return to 20.0 °C ± 0.1 °C.

6.2.5 Adjust the reflector mirror to make the field of view bright. Rotate the reading handwheel to make the light and dark boundaries appear in the field of view; at the same time, rotate the handwheel of the dispersive prism (Amici Prism) to make the color at the boundary line completely disappear; then rotate the handwheel to make the light and dark boundary line in the center of the cross line. Observe the scale value indicated on the right side of the reading lens's field of view; that is the measured value of the refractive index.

6.2.6 Record the refractive index value and retain it to the fourth decimal place.

6.2.7 Repeat the determination according to the above steps. The absolute difference between the two determination results shall not be more than 0.0002. Take the arithmetic mean value of the two determinations as the measurement results.

6.3 Automatic digital display refractometer method

6.3.1 Operate and set up the instrument according to the requirements of the instrument manual.

6.3.2 It may use water, ethanol, ether or a mixture of ethanol and ether to clean the surface of the prism of the measuring cell of the instrument; then use lens paper or medical cotton to absorb-dry the solvent.

6.3.3 Use a dropper to add a few drops of grade 2 water to the surface of the prism of the measuring cell of the instrument. The prism needs to be submerged. Close the measuring cover. Until the temperature reaches 20.0 °C ± 0.05 °C, the instrument automatically detects and displays the refractive index value.

The refractive index of grade 2 water shall be $n_D^{20}=1.333\ 0\pm0.000\ 1$.

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