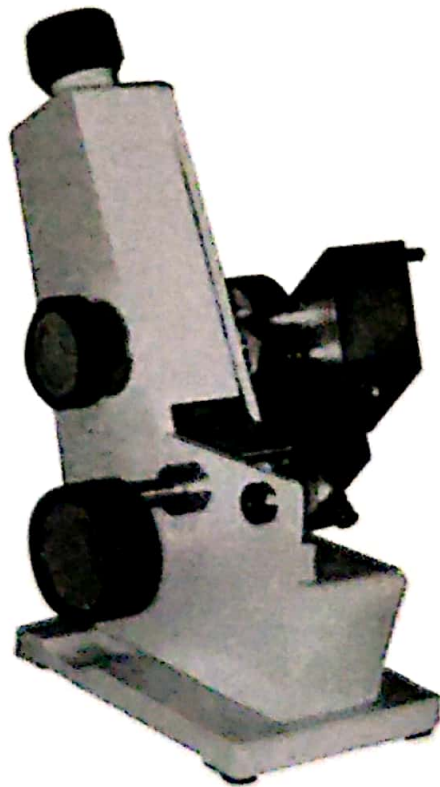


# **INSTRUCTION MANUAL**

## **2WAJ Abbe Refractometer**



## 2WAJ Abbe Refractometer

### INSTRUCTION MANUAL

#### Application:

Measurement of transparent and translucent liquids or solids and the average of the refractive index ND dispersion NF-NC. Equipment can also be received with thermostat, to determination of the temperature 0 °C -70 °C for the refractive index of ND, and measured the volume of sugar solution concentration in percentage of sugar content.

Therefore, this instrument is the oil industry, oil industry, pharmaceutical industry, building paint industry, food industry, daily-use chemical industry, sugar industry and geological survey of the factory and so on, teaching and scientific research units indispensable one of the commonly used equipment.

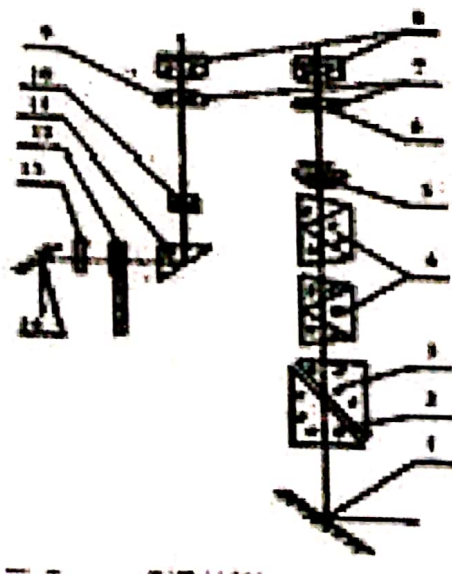
#### Specification:

	2WA J
Refractive index ND measurement range	1.300~1.700
Refractive index ND measurement accuracy	0.003
Refractive index ND Min. division	0.005
Glucose concentration (%) measurement range	0~95
Glucose concentration (%) Min. division	0.25

#### Construction:

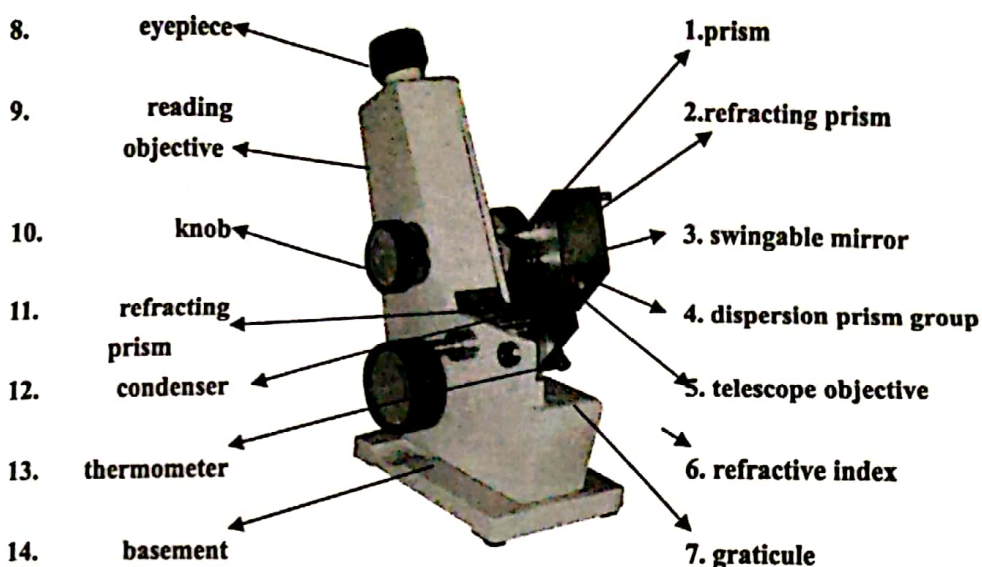
##### 1) Optical system:

The optical system of the instrument consists of a telescope and a reading system as show:



1. Incident prism
2. Refracting prism
3. swingable mirror
4. Dispersion prism group
5. Telescopic objective
6. Parallelogram prism
7. Graticule
8. Eyepiece
9. Reading objective
10. Reflecting mirror
11. scale plate
12. condenser

## 2) Mechanical system as shown below



### Operation:

#### 1. Preparation before measurement

1) Before measurement is made, the instrument should be calibrated with a standard glass block. Apply a drop of naphthalene bromide on the polished face of the glass block and stick it to the polished face of the refracting prism, with the other polished face of the glass block in an upward direction. When the reading microscope indicates the value marked on the standard glass, observe through the telescope whether the boundary line lies at the middle of the cross-line. Deviation, if any, may be adjusted by turning the adjusting screw with the square-headed pin provided as an attachment to the instrument until the boundary line is brought to the middle of the field of view. The screw should not be moved hereafter throughout the measuring process.

2) Before measurement is made, the incidental and the refracting prism should be cleaned to ensure that the measuring accuracy may not be affected by any foreign matter. When ether or alcohol is used as cleaning agent, it should be left to dry up before the testing liquid is added.

#### 2. Measuring procedures

1) When the surface of the prism has been cleaned, add the testing liquid with a dropper onto the forested face of the incidental prism and tighten the prism locking screw. The liquid should be free from bubbles and cover the field of view completely. If the liquid is highly volatile, it should be supplied during measurement with a syringe through the small hole located at the side of the prism assembly.

2) Adjust the two reflecting mirrors and until the two lens tubes are well illuminated.

3) Observe through the telescope and rotate the prism assembly by turning the knob to bring the boundary line to the centre of the cross line. In the meantime, turn the knob for actuating the Amici prism until no color other than black and white appears in the field of view. Then observe through the reading microscope, and the scale value indicated at the right side of the field of view is the  $N_D$  to be measured.

4) If the testing object is a solid, it should comprise two polished faces perpendicular to each other. The measurement is done without the use of the reflecting mirror and the incidental prism. Stick one

polished face of the solid with naphthalene bromide onto the refracting prism, with the other polished face directing upwards. The remaining procedures are the same as above. When the refractive index of the testing solid is greater than 1.66, diazomethane should be used instead of the Nathalie bromide.

- 5) When the solid to the measured is semi-transparent, it should comprise one polished face which is stuck onto the

**Precautions and maintenances:**

In order to ensure the measurement accuracy and to avoid damage, please attention to precautions and maintain the instrument.

- 1) The instrument should be kept in a dry and well-ventilated room to prevent the optical part from mould.
- 2) After dealing with corrosive liquid, the cleaning work should be done in time to prevent from corrosive damage, including optical and mechanical parts as well as the painted surface. Finishing the test, the instrument must be cleaned and put it into a wooden box in which desiccant should be kept.
- 3) Any hard contaminant is not supposed to be left in the sample under test. When testing with solid sample, the surface of the refracting prism should be kept from scrape of impression.
- 4) The instrument should always be kept clean, never touch the optical parts with your fingers. Cleaning of the optical parts might be done by firstly rubbing lightly with a piece of high grade chamois or absorbent cotton, the blow it with a blower. As for the smear on the optical surface, it can be removed in time using xylene or ether.
- 5) The instrument should be protected against drastic vibrant and impact to prevent the optical lens from being damaged, which will affect the test accuracy.

**Packing list:**

1. Abbe refractometer 1set
2. Special thermometer with protective covers 1 set
3. Standard specimen 1pc
4. Naphthalene bromide 1 bottle
5. Screwdriver 1 pc
6. Operation manual 1 copy