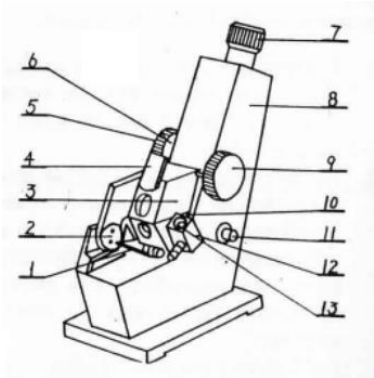
Instructions for use Abbe refractometer

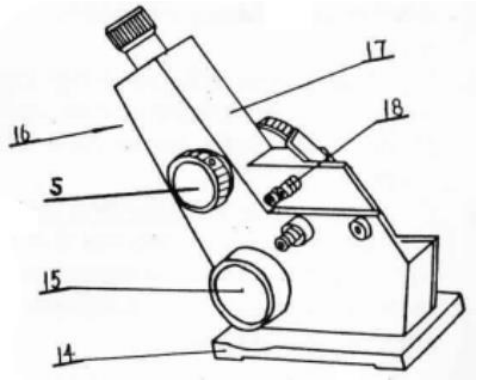
Measuring ranges

The Abbe refractometer is a tool for determining the refractive index nD of liquids or solids with transparency properties. It is designed for thermostating in a range from 0 to 70 ° C. Abbe's refractometer can also determine the percentage of sugar concentration (% Brix) contained in a sugar solution.

Measuring range:	1.300 ÷ 1.700 (nD)
	0 ÷ 95% Brix
	-50 ÷ +70 °C
Resolution:	0.0005 (nD)
	0.25% Brix
	0.1 °C

External structure of the refractometer





1. Reflector of the lower refraction prism (fixed)
2. Connecting pin between the two prisms
3. Upper entrance prism (movable)
4. Light entrance cover, upper prism
5.6. Optical scale contrast adjustment knob
7. Adjustable eyepiece with focus
8.17. Instrument body
9. Upper prism lock / unlock knob
10. Lower refractive prism (fixed)
11. Light source receptor (lamp)
12. Support for control thermometer
13. Screw hole for the thermometer
14. Base
15. Knob for pointing the reading
16. Reading calibration screw
18. Connections for rubber pipes for thermostating

Work procedure

Calibration and control of the instrument

Before taking the measurements it is necessary to calibrate the refractometer with a sample standard. There are two control methods:

with distilled water:

after checking that the refractometer is operating at 20 ° C through the control thermometer (with large temperature deviations, it is suggested to connect a thermostatic bath to the reading prisms, to thermostat the reading at 20 ° C), deposit some drops of distilled water on the lower prism (10), turn the upper prism (3) and lock it using the knob (9); adjust the contrast of the optical scale with the knob (5) until a sharp contrast line is obtained above the measurement scale in the reticle;

turn the knob (15) until the black field matches the center of the cross (read the value on the lower scale, which must be at 20 ° C: nD 1,333 or 0.0 Brix). Any deviations can be corrected by acting on the calibration screw (16).

With calibration prism:

add one or two drops of bromine naphthalene on the surface of the lower prism (10), place the calibration prism supplied on it (write the nD value silk-screened on the calibration prism on a sheet); turn the upper prism (3) gently, resting it on the calibration prism; adjust the contrast of the optical scale with the knob (5) until a sharp contrast line is obtained above the measurement scale in the reticle; turn the knob (15) until the black field corresponds to the center of the cross (read the value on the lower scale, which must correspond to that shown on the calibration prism). Any deviations can be corrected by acting on the calibration screw (16). After calibrating the refractometer, clean the surface of the prism, removing the sample with absorbent cotton; at this point the refractometer is ready to take the measurements.

1. Determination of the nD of a transparent and translucent liquid
   Proceed as for calibration with distilled water, using the sample to be measured. Now the value read through the eyepiece is the refractive index of the liquid to be determined.
2. Determination of transparent solid
   The solid to be determined must have a shiny and smooth surface. Open the upper prism (3), put a drop or two of bromonaphthalene on the shiny surface of the lower prism (10). Clean the shiny surface and position the solid making it adhere well to the surface. Then proceed as for calibration with the prism. If the refractive index of the solid to be determined is greater than 1,656, use bi-iodine methane.
3. Determination of a translucent solid
   The solid to be determined must have a shiny and smooth surface. The shiny surface must be fixed on the lower prism (10) with bromonaphthalene. Then proceed as in step 2.
4. Determination of the concentration of sugars
   The method is the same for determining the refractive index in liquids. The value must be read on the upper part of the scale, where it indicates the sugar concentration expressed in% Brix.
5. Determination of nD and Brix with different temperatures
   Fit the thermometer in its support (12) by screwing it into the screw (13). Thermostate the reading prisms with water, connecting them with rubber pipes to a thermostatic bath. Put the water in circulation, and after ten minutes that the temperature has stabilized, take the measurement.

Maintenance

1. The place where the refractometer is placed must be dry and ventilated, to prevent the optical parts of the refractometer from being damaged by humidity.
2. If corrosive liquids are determined, the cleaning of the optical and metal parts must be done in a short time to avoid the onset of corrosion.
3. The solid sample to be determined must have flat and non-rough surfaces to avoid damaging the refraction surface of the prism.
4. Always keep the refractometer clean. Do not touch the optical parts with oil, or with wet hands. If the surface of the optical parts is dirty, use absorbent cotton to clean it. If the surface is dirty with grease, use an alcohol solution to clean it.
5. Avoid that the refractometer undergoes shocks and vibrations in order not to damage the optical parts, affecting the accuracy of the instrument.

Disposal of electronic devices



Electrical and electronic equipment marked with this symbol cannot be disposed of in public landfills. In accordance with EU directive 2002/96 / EC, European users of electrical and electronic equipment have the option of returning the used equipment to the Distributor or Manufacturer when purchasing a new one. Abusive disposal of electrical and electronic equipment is punished with a pecuniary administrative sanction.