

The Abbe Refractometer: Measuring the Refractive Index of a Liquid

- 1 Turn on the light. Check that the cooling water is flowing and record the water temperature on the precision thermometer to 0.1 °C.
- 2 Open the Incident Prism (with the Prism Lock Knob). Clean the prism face with acetone and carefully blot it dry with a KimWipe.
- 3 Place a few drops of the liquid to be tested on the polished surface of the lower Refracting Prism. Close the hinged upper Incident Prism and lock it into place with the knob, so that the liquid is evenly distributed on the face of the Refracting Prism.
- 4 Scan the lower large adjustment knob until a light and dark divided image can be seen. (See image below right)
- 5 Adjust the dispersion, using the upper smaller Dispersion Correction Knob, until a sharp light/dark boundary is seen.
- 6 Center the boundary in the crosshairs of the telescope using the lower large adjustment knob and read the refractive index from the green scale below the boundary.

There are two scales visible. Read the one showing 1.xxx to 4 decimal places, by estimating the last digit. (The other scale is specific for aqueous sugar solutions and reads % sucrose.)

Correct the experimental reading for temperature using the following equation:

$$n_D^{20} = n_D^T + 0.00045(T - 20 \text{ } ^\circ\text{C})$$

where n_D^T is the experimental RI value measured at temperature, T.

Problem: A completely black field of view or non horizontal dark/light boundary regardless of coarse adjustment position is usually indicative of sample evaporation. Add more sample.

