

B8H24920 Philip Harris Potometer

NFU 684

Purpose

To enable students to measure transpiration in plants. The apparatus can also be used to measure humidity by connecting a porous pot.

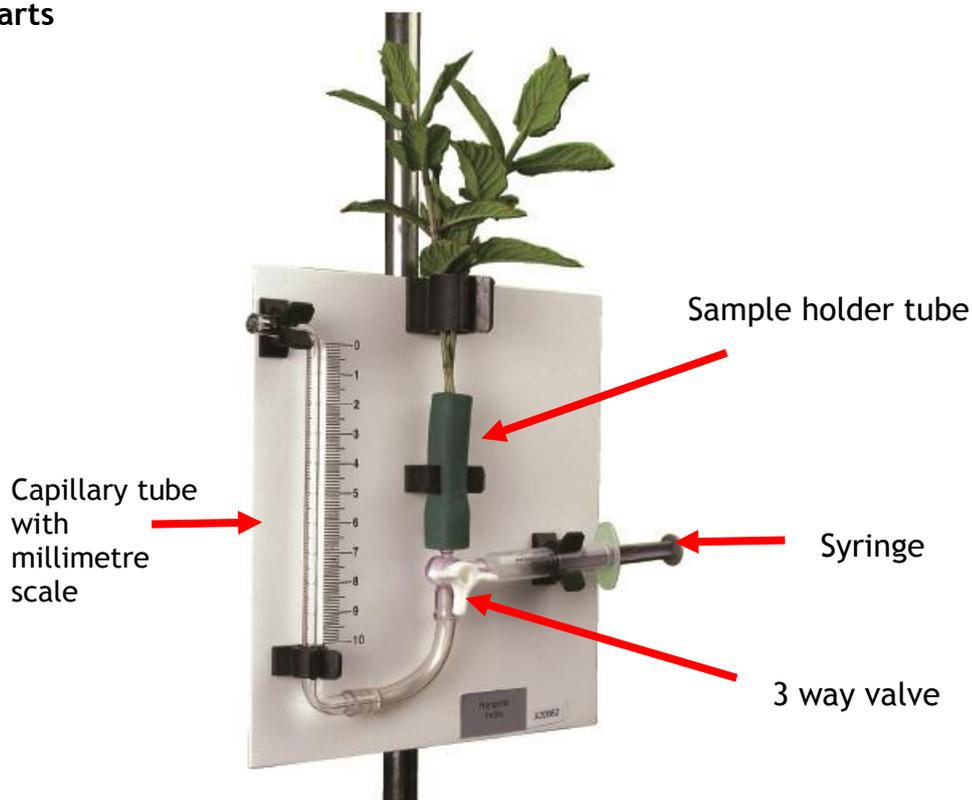
Contents

Potometer, syringe, capillary tube, 3 way tap, back board that fits to a retort stand.

Safety advice

Safety goggles should be worn at all times.

Potometer parts



Assembling the Potometer

The use of leaves that have a waxy cuticle eg, beech, lilac, spirea give better results. The shoots must be cut under water and the potometer should be assembled under water. This is to reduce the intake of air into the xylem vessels of the plant. A large sink or washing up bowl can be used. The potometer should be left for the leaves to dry or the leaves can be dried gently using a paper towel. This is important as the potometer will not work correctly if there is excess water on the leaves. Adding food colouring to the water makes it easier to see the air bubbles in the capillary tubing.

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Method of use

Secure the Potometer in a retort clamp stand.

Unclip the syringe from the apparatus and fill it with water, removing air bubbles before reattaching.

Purge the air from the capillary tube by pressing the end of the syringe

Purge all the air from the sample holder water tube by pressing the end of the syringe

Cut a plant sample with a stem of appropriate size to fit the inner diameter of the sample holder / rubber stopper tube. Cut the sample with extra length on the end to allow further preparation of the plant sample.

An alternative is to attach a short length of narrow rubber tubing to the plant stem which will fit snugly into the sample holder. The tip of the rubber tubing should be cut while submerged in water to prevent air getting into the plant capillaries.

Place Blu-Tack or petroleum jelly around the sample to seal. Hold a finger over the submerged stopper-tube to keep water in it.

Attach the sample holder/stopper tube to the sample water tube attempting to keep as much air out of the tube as possible.

If necessary purge air out of the sample holder using the water filled syringe. Use the syringe to adjust the zero point on the capillary tube. This is done by withdrawing the syringe until air reaches the zero point in the capillary tube.

Adjust the 3 way valve to the measurement position and record the time. It is now possible to take readings of the volume of water used by the plant sample using the difference in the water level from the zero point.

Suggested experiments

The Potometer can be used to measure transpiration under different circumstances such as under light, the effect of covering the underside of leaves with petroleum jelly (stops transpiration), the effect of air circulation, temperature etc. by re-adjusting the zero point on the same sample under differing conditions.

Shoot can be replaced by porous pot to demonstrate the drying effect of the atmosphere

Suggested accessories

Retort stand
Porous pot with bung and glass tube

Supplier details:

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