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EXPERIMENT NO. 1

NAME OF EXPERIMENT: DEMONSTRATION OF THE PROCESS OF OSMOSIS BY POTATO OSMOSCOPE METHOD.

APPARATUS REQUIRED

1. A petri-dish
2. A large potato.
3. Knife.
4. Pins
5. Scalpel.

CHEMICALS REQUIRED

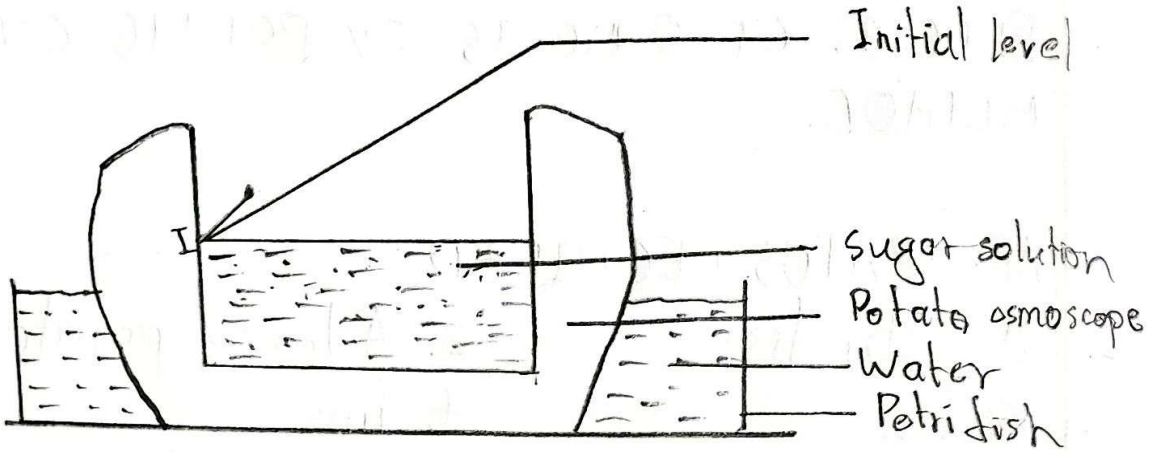
1. Sugar solution (20%)
2. Water.

THEORY

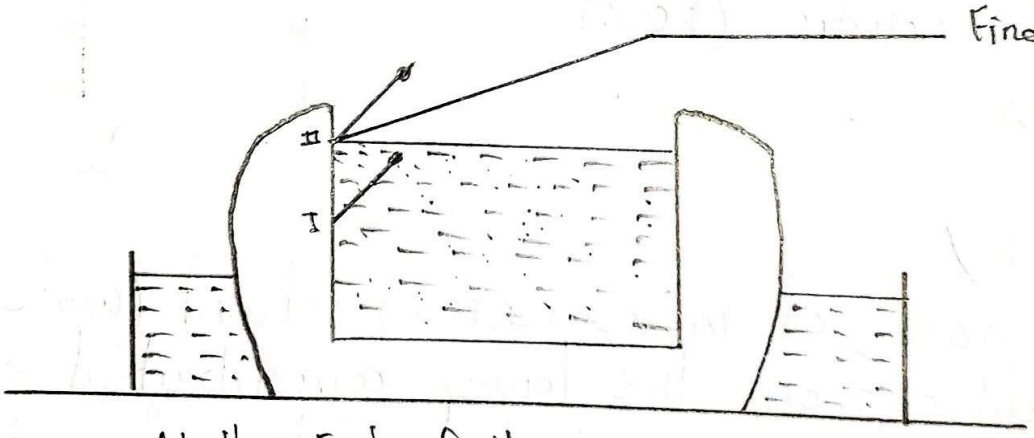
The process of movement of solvent (water) molecules from the lower concentrated solution to the higher concentrated solution through a semipermeable membrane is called osmosis.

The process of osmosis continues in between solvent and its solution until the hydrostatic pressure becomes equal to the osmotic pressure of the solution. It is of two types:

i) Exosmosis
ii) Endosmosis.



At the Beginning of the Experiment



At the End of the Experiment

PROCEDURE

A large size potato tuber was taken and its skin was peeled out. Its one side was cut with the help of a knife to make its base flat. Then, a hollow cavity was made from another side of the potato by scooping the flesh of the potato using a scalpel, so that a very thin base was left intact. After that, the potato osmoscope was kept in the Petri dish containing water just enough to dip a half portion of the potato osmoscope. Sugar solution (20%) was poured up to half of the cavity of the potato osmoscope and its initial level was marked with the help of a pin. The whole setup was left undisturbed for few hours.

OBSERVATION

After few hours, it was observed that the level of sugar solution in the potato osmoscope had risen. The final level was marked with the help of the next pin.

RESULT AND CONCLUSION

The rise in the level of sugar solution in the potato is due to the entry of water from Petri dish, through the potato cells, to the solution.

Thus, the potato cells act as semipermeable membrane and this movement of water molecules from their region of higher concentration (water of Petri dish) to the region of lower concentration (sugar solution) through semipermeable membrane (potato cells) is called osmosis.

PRECAUTIONS

1. The skin of the potato should be peeled out properly.
2. The thin layer of potato between flat base and cavity should remain unruptured.
3. The cavity wall should be as thin as possible.
4. The sugar solution should have a higher concentration than the cell sap of potato cells.
5. The pins should be fixed very carefully.