

# PHOTOSYNTHESIS

It is possible to perform a simple test to identify the presence of starch in the leaves of plants using iodine. However, it is necessary to remove the chlorophyll first as it will interfere with the colour test for starch.

Starch production can be related to the process of photosynthesis. In this experiment some plants are placed in the dark and others are grown in light. The leaves of each plant are tested for starch to determine whether photosynthesis has taken place in both sets of conditions.

## Materials needed

- Two leaves from the same plant: one which has been kept in a dark cupboard; the other one which has been exposed to light
- 150mL methylated spirits
- hotplate
- 2 x 500mL beakers
- 2 x 150mL beakers
- 2 x petri dishes
- forceps
- scissors
- wooden tongs
- wash bottle (demineralised water)
- iodine solution
- marker pen
- latex gloves
- paper towel

## Method:

1. Put 100mL of water in each of the 500mL beakers, place on the hot plate and bring to the boil.
2. Take one leaf from each plant:
  - ❖ Plant kept in the light
  - ❖ Plant kept in the dark

(Hint: to distinguish between the light and dark leaves you may wish to keep the stem on one and cut the stem off the other. Make sure you note which is which!)

3. Boil the leaves for 2 minutes with one leaf per beaker. (Why do you think this is?). Remove the leaves, place on paper towel and record their appearance.
4. Place each leaf in a different 150mL beaker and safely cover with methylated spirits.
5. Using tongs, put each small breaker into a large beaker, which becomes a water bath to safely heat the methylated spirits.
6. Heat for a few minutes and then remove each leaf and rinse, over the sink using the washer bottle.
7. Place each leaf in a separate petri dish and describe their appearance.

8. Cover each leaf with iodine solution. Leave for 2 minutes and then describe each leaf.

### **Questions**

1. What is the reason for placing the leaves in boiling water?
2. After treatment with boiling water, the leaves were placed in methylates spirits to decolourise them. What was the reason for decolourising the leaves?
3. Explain the results you obtained when the decolourised leaves were placed in iodine.
4. From your results with the leaves in the dark and in the light, what conclusion can you make about light?
5. What is the connection between starch and photosynthesis?
6. Write a conclusion for this investigation. It should include the words photosynthesis, starch and sunlight.