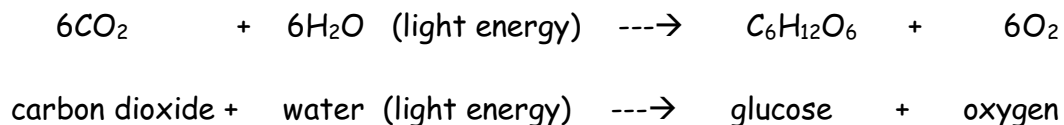


Photosynthesis

Photosynthesis is a very important process in nature. It is the production of energy in the form of glucose involving water from the soil, carbon dioxide from the air and light energy from the sun. It takes place in all green plants, which use the green chlorophyll, held in chloroplast in the leaves, to trap light. The main site of photosynthesis is the palisade layer in the leaf of a plant. The cells in the palisade layer contain the green chloroplasts. They are near the upper side of the leaf where they can obtain the maximum amount of light, they are packed very close together and as already mentioned contain green chloroplasts clustered towards the upper side too. Plants photosynthesise to produce food that needed to allow them to grow. The main reaction is to produce glucose and the oxygen is form as the by-product. If the plant does not need to use all the glucose immediately then it is stored which is difficult because glucose is hard to store in water. The plants solve this problem by joining hundreds of glucose molecules together to make starch. Starch does not dissolve in water very well so it makes a better food store. As plants respire both day and night this starch is often used up during the night when photosynthesis cannot take place. The uses of glucose within the plant are for active transpiration, cell division, the production of protein and the production of cellulose. However many other things can also be produced with the addition of special mineral salts.

In photosynthesis the raw materials are carbon dioxide and water. They react to form the products of the reaction-oxygen and starch (glucose that has been stored). The reactions need energy and this comes from light. The green chloroplasts allow light to be used as energy and therefore both of these things are like helpers in the reaction. Glucose is formed firstly than turned into starch to be stored up fore when it is needed.

Although photosynthesis is a complicated process it can be summed up in this equation:



It is important to the reaction that certain factors are present when it is occurring. We know that these are carbon dioxide, water, light and chlorophyll. Without these the reaction will not take place at all. In my

experiment I want to find out how important that carbon dioxide, water and light for a plant.

Aim

The aim of my experiment is to determine whether or not plant store the starch after the photosynthesis. And find out how was a plant without carbon dioxide. To show the leaf contains starch, we use iodine solution. If the iodine turns blue black, this shows that the leaf contains starch.

Testing a leaf for starch

Use a plant kept in light.

Detach a leaf, holding it in forceps plunge into boiling water for 5 seconds. This will kill the cells, stop all chemical reactions and make the leaf permeable to alcohol and iodine solution.

Push the leaf to the bottom of a boiling tube and cover with ethanol, place in the water bath and leave for 5 minutes. The ethanol will boil and dissolve out the chlorophyll in the leaf.

Remove the tube from the bath and carefully tip the ethanol solution into the beaker for waste ethanol.

If the leaf is still green add more ethanol and place in water bath for another 5 minutes and drain as before.

Fill the tube with cold water and the leaf will probably float to the top, remove the leaf and spread it out onto a white tile, rinse it gently with to remove the ethanol. Using a dropper cover the leaf with iodine solution and leave for 1 minute.

Gently rinse the iodine away with a fine trickle of water.

A positive result will give a blue colouration of the leaf.

(We had been given 4 different leaves, and we had tested 4 different leaves with the same ways)

Leaf (a) is from a healthy plant.

Leaf (b) is from a plant without carbon dioxide

Leaf (c) and (d) we need to find out where is it from

Result

Leaf (a) :

After the experiment, I found that the leaf turned blue black. And most of the blue black are at the 'front' of the leaf and this show that the leaf store most of the starch on the 'front' of the leaf.

Leaf (b) :

After the experiment, I found that the leaf turned blue black but not as blue black as leaf (a) and the part that cover with the aluminium foil had more starch compare with the part that didn't cover with aluminium foil. This show that the leaf still contain starch but some of the starch has been send to the part that can't photosynthesis (cover by the aluminium foil) and the part that cover by the aluminium foil store the starch that had been send to there. This process make the part cover by the aluminium foil easier to get starch for respiration and some reaction.

Leaf (c) and (d) :

After the experiment, I found that the leaf (c) and (d) not change colour. These show that the leaf (c) and (d) didn't have any starch in the leaf and the leaf didn't photosynthesis at all. This may be cause by the absent of water, sun light, carbon dioxide or chlorophyll. Process of Photosynthesis can't lose any one of these factors, if not photosynthesis can't process at all.

Discussion

In the experiment I found that starch could be found by using the iodine solution. In a healthy plant, most of the starch store at the 'front' of the leaf. If we cover a part of the leaf by aluminium foil, the part that didn't cover will send some of the starch to the part that cover by aluminium foil. The part that covered by aluminium foil also will store the starch when they 'receive' the starch. In the experiment, I also found that photosynthesis can't process when the absent of water, sun light, carbon dioxide or chlorophyll. These factors are important for leaf to photosynthesis and 'make' their own food. Although plant can make their own food by photosynthesis, they do not survive for very long if they are only provided with water, carbon dioxide and light. Plants need minerals and vitamins for healthy growth, so plants need more than simply the products pf photosynthesis to survive. The major requirement for plant are Nitrate, Phosphate and Potassium. Without any of these minerals, the

plant will look decidedly sickly. Plant need sun light, water, carbon dioxide and minerals to growth healthy.

Leaf :

leaf (a)

leaf (b)

leaf (c)

leaf (d)