

Biology Alternative to Practical

Buired Test for Proteins

This test is used for the presence of proteins by seeing if the blue reagent turns purple.
In order to test for the presence of proteins, first add Sodium Hydroxide (NaOH) then Copper Sulfate to the solution. If protein is present, a mauve/purple color appears.

Emulsion (Ethanol) test for Fats

This test is used for the presence of lipids in a substance.
In order to test for the presence of fats, add a food sample in a tube. Add 2cm of ethanol to the food sample in the tube. Wait a bit. Shake it well. Then add 2cm of water. If fats are present, a white emulsion (white layer) develops. If fats is not present, the liquid remains clear.

The reason why the white emulsion develops it is because lipids are soluble in ethanol and NOT in water. Water caused droplets to develop once the lipids are dissolved in ethanol and the white color comes from light scattered through the water.

Effect of Carbon Dioxide on the Rate of Photosynthesis

Low concentration of CO_2 = Low rate of Photosynthesis
High concentration of CO_2 = High rate of Photosynthesis

In order to test the effect of Carbon Dioxide, we place a tube of a pond weed in a tube containing water at 25°C , then put it in a beaker of fresh water with sodium carbonate (NaHCO_3) (Gives constant saturated solution of CO_2) Then put a lamp at a fixed distance away from the beaker at room temperature of 20°C . In one minute period, count oxygen bubbles given off by the plant which indicates the rate of Photosynthesis. Check if its oxygen shows a glowing splint.
Repeat the experiment at different lower CO_2 concentrations by using different dilutions of saturated solution. Change NaHCO_3 and temperature. Graph the results with rate of photosynthesis on X-axis and CO_2 concentration on Y-axis.

On the graph, the line (Rate of Photosynthesis) steadily increases because of the increasing CO_2 concentration. The line eventually falls because the certain CO_2 concentration has no effect on the rate of photosynthesis and becomes limited.

Photosynthesis investigations – Chlorophyll, CO_2 , light tests

Is chlorophyll needed for photosynthesis?

Take a plant with green/white leaves. Destarch it by keeping it in the dark for 48 hours. Expose plant in sunlight for few days. Test 1 of the leaves with iodine solution (brown). If the colour turns from brown to blue/black, chlorophyll patches are present and green patches means Chlorophyll is present. If the colour remains brown, no chlorophyll patches are present and pale yellow patches means Chlorophyll is not present.

Is light essential for photosynthesis?

Take a potted plant. Destarch it by keeping it in the dark for 48 hours. Check if starch is present in one of the leaves by boiling the leaf in hot ethanol in a hot beaker of water (breaks down cell membranes & softens cell walls) and add drop of iodine solution to see if the colour brown turns into purple/black. After put the leaf between two strips of paper and place it in the sunlight for a few days. Remove cover and do starch test (iodine solution).