

# Photosynthesis

In the presence of water, light, chlorophyll and carbon dioxide, the formation of carbohydrates in plant is called photosynthesis.

Carbon dioxide, water, chlorophyll and sunlight are necessary for photosynthesis

1. Terrestrial plants take CO<sub>2</sub> from atmosphere whereas aquatic plants use carbon dioxide dissolved in water.
2. Water enters into the cells of the leaves through osmosis and CO<sub>2</sub> through diffusion from atmosphere or release during respiration.
3. Water necessary for photosynthesis is absorbed by the root and the oxygen produced during photosynthesis is due to photolysis of water.
4. The green colour of the plants is due to the presence of chlorophyll. Chlorophyll are photoreceptor molecules, which trap the solar energy. There are different types of chlorophyll molecules like 'a', 'b', 'c', 'd' & 'e'. Chlorophyll 'a' & 'b' are most common and are found in a plant.
5. There is an atom of magnesium in the centre of chlorophyll.
6. Chlorophyll absorbs the violet, blue and red colours of light. The rate of photosynthesis is maximum in red light and is minimum in violet light.
7. The process of photosynthesis is a reaction of oxidation and reduction. Oxidation of water takes place forming oxygen and reduction of carbon dioxide takes place forming glucose.

The stages of the process of photosynthesis

- (i) Photochemical reaction or light reaction and
- (ii) Dark reaction

**(i) Photochemical reaction :** This reaction is completed in the grana part of the chlorophyll. This is also called Hill reaction. In this process break down of water takes place and hydrogen ion and electron is formed. For photolysis of water, energy is received from the light. At the end of this process, ATP is formed from ADP & P.

**(ii) Dark chemical reaction :** This reaction takes place in the stroma of chlorophyll. In this reaction reduction of carbon dioxide takes place and sugar or starch are formed. It is also known as Calvin Benson cycle.

Jkchrome