4. Compare and contrast the conversion of light energy in photosynthesis and photovoltaic cells.

answer:

Photosynthesis:

Photosynthesis is the process by which plants, algae, and some bacteria convert lightenergy from the sun into chemical energy stored in organic molecules. This process is critical forlife on Earth, as it provides the primary source of energy for all living organisms.

working :

- The process of photosynthesis takes place in chloroplasts, found in the cells of green plants and algae.
- Chloroplasts contain chlorophyll, a pigment that absorbs light energy from the sun.
- The absorbed light energy is used to power a series of chemical reactions that convert carbon dioxide and compounds like water into organic glucose.

The overall equation for photosynthesis is:

6 CO2 + 6 H2O+ light energy → C6H12O6 + 6 02

Photosynthesis can be divided into two stages:

1. light-dependent reactions

- These reactions take place in the thylakoid membranes of the chloroplast and require lightenergy.
- During these reactions, light energy is absorbed by chlorophyll and converted into chemical energy in the form of ATP (adenosine triphosphate) and NADPH (nicotinamide adenine dinucleotide phosphate). Water molecules are also split during this stage, releasing oxygen gas.

2. light-independent reactions (dark reaction).

- The biochemical reactions take place in the stroma of the chloroplasts and do not require light energy (in absence of light).

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