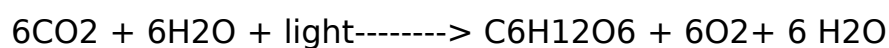


Photosynthesis

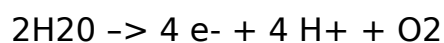
[Science](#), [Biology](#)



Photosynthesis Photosynthesis relates to the process through which green plants and other specific organisms use sunlight in synthesizing carbohydrates from water and carbon dioxide. The process occurs in three imperative stages including harnessing sunlight energy, synthesizing NADPH and ATP using energy harnessed, with the last step being Calvin cycle involving CO₂ fixation. Calvin cycle as the last step uses ATP, CO₂, NADPH, and ribulose 1, 5-biphosphate to synthesize glyceraldehydes 3-phosphate used in production of sugar and starch through glycolysis (Hurd et. 179). The overall process of photosynthesis occurs through the chemical reaction outlined as.



Evidently, the above process indicates that water only finds use in synthesis of energy molecules used in the subsequent steps. The steps involved in initiation of sugar synthesis entails fixation of CO₂ to ribulose 1, 5-biphosphate to form glyceraldehyde 3-phosphate.



In establishing whether oxygen atoms fixed on ribulose 1, 5-biphosphate originates from water or carbon dioxide, the investigation would use oxygen-18 isotope contained in CO₂. The study would incubate algae plant in water and supply only radioactively labeled CO₂ containing Oxygen-18. The study would then allow the process to proceed in the presence of sunlight for some minutes. Oxygen-18 as a radioisotope would remain traced throughout the entire process to establish the final product contains oxygen atoms from CO₂ or H₂O through chromatographic methods. If the analysis indicates that oxygen-18 remains exclusively present in the final sugar product, the CO₂

contributes oxygen atoms during photosynthesis otherwise it would be H₂O.

Work Cited

Hurd, Catriona L., Harrison, Paul J., Bischof, Kai, Lobban, Christopher S.

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