How does photosynthesis work?

Photosynthesis is the process plants and some algae use to convert light energy to chemical energy stored as sugar within chloroplasts-- the energy factories found in plant cells. Plants need only carbon dioxide and water for photosynthesis to work.

How do cellular respiration and photosynthesis work together?

Both are byproducts of reactions that move on to other reactions. Photosynthesis absorbs energy to build carbohydrates in chloroplasts, and aerobic cellular respiration releases energy by using oxygen to break down carbohydrates in mitochondria. Both organelles use electron transport chains to generate the energy necessary to drive other reactions.

Are carbohydrates a storage molecule?

Carbohydrates are storage moleculesfor energy in all living things. Although energy can be stored in molecules like ATP,carbohydrates are much more stable and efficient reservoirs for chemical energy.

What molecule does photosynthesis produce?

Photosynthesis requires sunlight,carbon dioxide,and water as starting reactants (Figure 3). After the process is complete,photosynthesis releases oxygen and produces carbohydrate molecules,most commonly glucose. These sugar molecules contain the energy that living things need to survive.

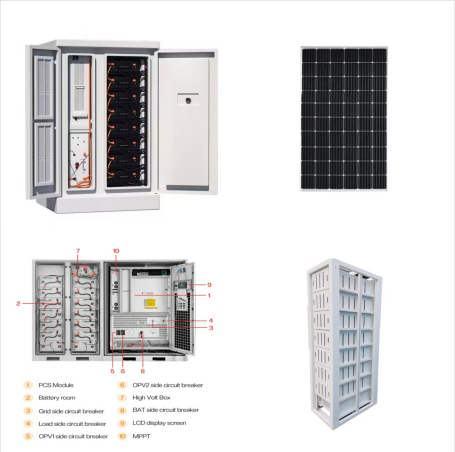
How much energy is stored by photosynthesis a year?

Despite the low efficiency,the amount of energy stored by photosynthesis each year in the biosphere is still roughly four times that of the annual consumption by humans[1]. The fossil fuels we use today are all made from ancient photosynthesis. Coal,petroleum,and natural gas are decomposition products of plants and animals.

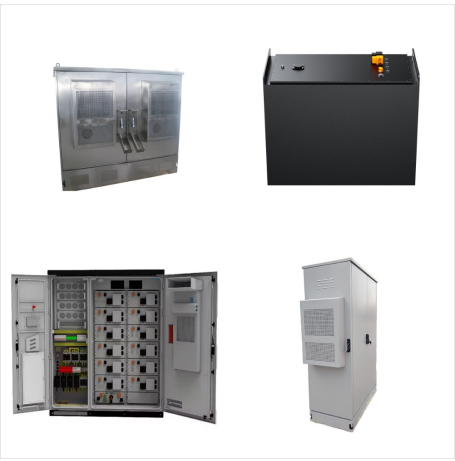
Which chemical energy is stored in ATP and NADPH?

The chemical energy that plants useare stored in ATP and NADPH. ATP and NADPH are two kinds of energy-carrying molecules. These two molecules are not only in plants,as animals use them as well. Plants need water to make NADPH. This water is broken apart to release electrons (negatively charged subatomic

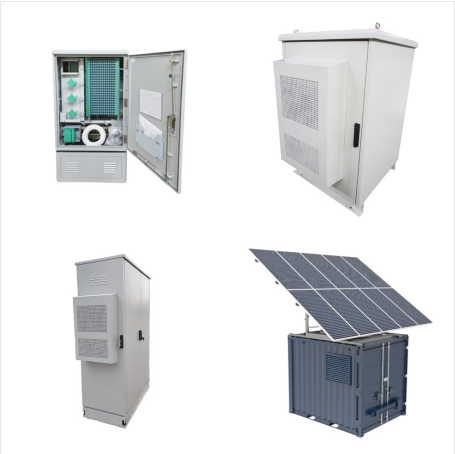
particles).



Photosynthesis is vital because it evolved as a way to store the energy in solar radiation as high-energy electrons in the carbon-carbon bonds of carbohydrate molecules. Those carbohydrates ???

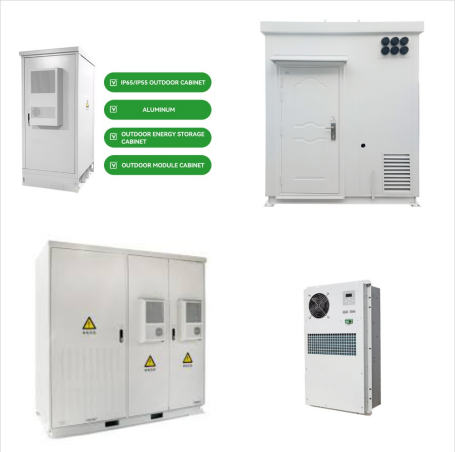


Like all other forms of kinetic energy, light can travel, change form, and be harnessed to do work. In the case of photosynthesis, light energy is converted into chemical energy, which photoautotrophs use to build carbohydrate molecules. However, autotrophs only use a few specific components of sunlight. 8.6: Light-independent Reactions

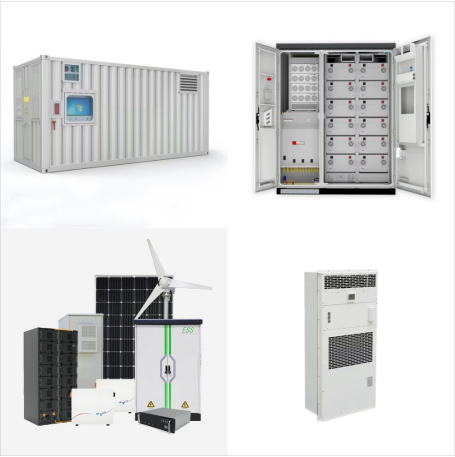


There are several factors that can affect how many energy storage molecules producers (such as plants or algae) are able to make. These factors include: Sunlight availability: Producers rely on sunlight for the process of photosynthesis, where they convert light energy into chemical energy in the form of energy storage molecules like glucose.

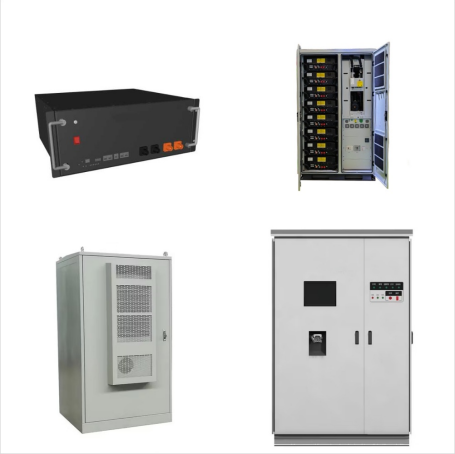
ENERGY STORAGE MOLECULES IN PHOTOSYNTHESIS



The Calvin cycle has four major steps: carbon fixation: Here, the plant brings in CO 2 and attaches it to another carbon molecule, using rubisco. This is an enzyme, or chemical that makes reactions move faster.This step is so important that rubisco is the most common protein in a chloroplast ??? and on Earth.



These sugar molecules contain energy and the energized carbon that all living things need to survive. Figure (PageIndex{3}): Photosynthesis uses solar energy, carbon dioxide, and water to produce energy-storing carbohydrates. Oxygen is generated as a ???



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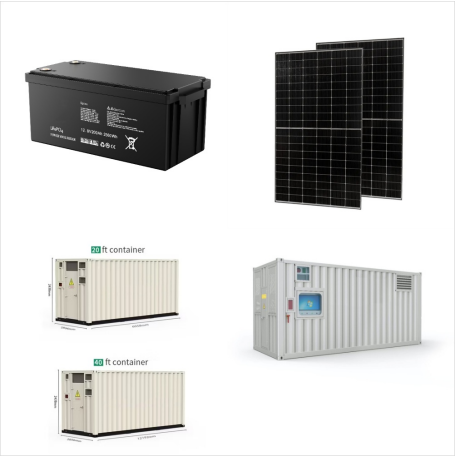
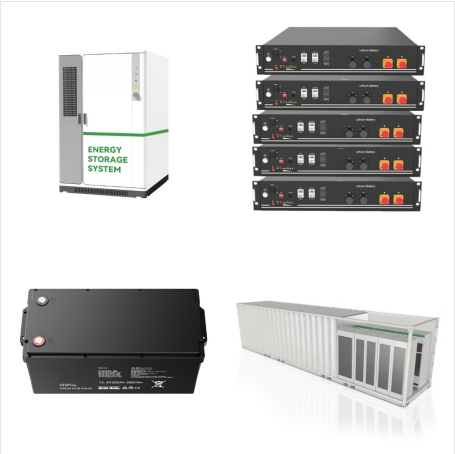
use light energy to make two molecules needed for the next stage of photosynthesis: the energy storage molecule ATP. ATP. can be used to store energy for future reactions or be withdrawn to pay for reactions when energy is required by the cell; plants capture and store the energy they derive from light during photosynthesis in ATP molecules.

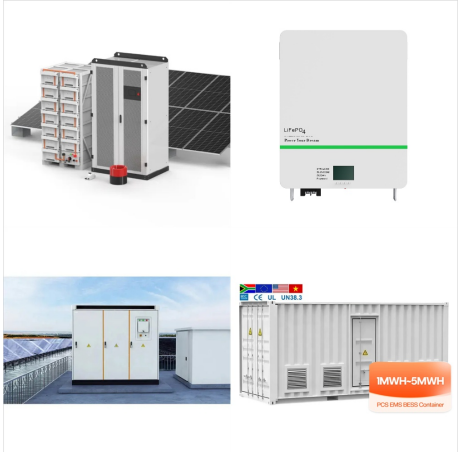


Light Energy to Chemical Energy. Excited electrons that have absorbed light energy are unstable. However, the highly organized electron carrier molecules embedded in chloroplast membranes order the flow of these electrons, directing them through electron transport chains (ETCs). At each transfer, small amounts of energy released by the electrons ???

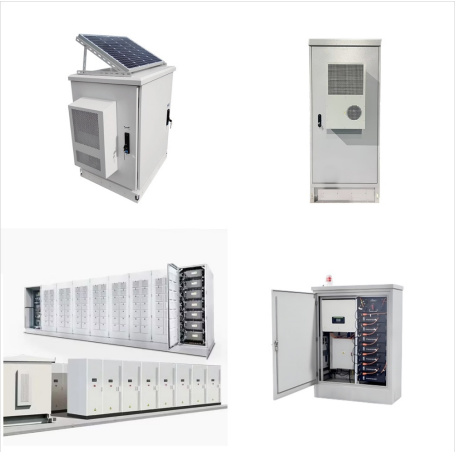


Biology, through photosynthesis, gives a first draft template for storing solar energy at an enormous scale. Across the globe, it's estimated that photosynthetic organisms capture solar power at an average rate of ??? 4,000 EJ yr-1 (corresponding to an annually averaged rate of ??? 130 terawatts (TW)) [].This energy capture rate is approximately 6.5 times greater than ???

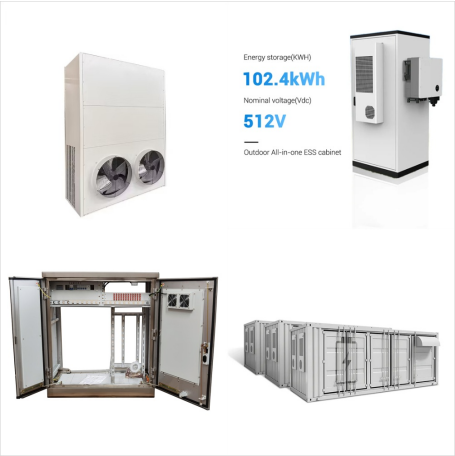
ENERGY STORAGE MOLECULES IN PHOTOSYNTHESIS



Explain how photosynthesis works in the energy cycle of all living organisms; the cell has the fuel needed to build carbohydrate molecules for long-term energy storage. The products of the light-dependent reactions, ATP and NADPH, have lifespans in the range of millionths of seconds, whereas the products of the light-independent reactions

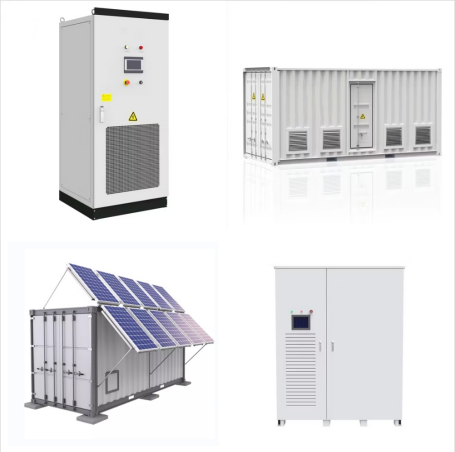


During the process of photosynthesis, cells use carbon dioxide and energy from the Sun to make sugar molecules and oxygen. These sugar molecules are the basis for more complex molecules made by

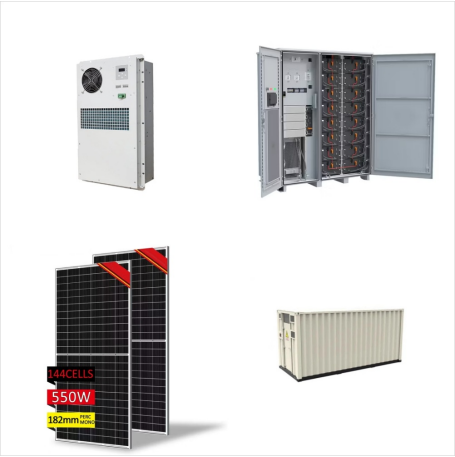


The protons and electrons are then transferred through the thylakoid membrane to create the energy storage molecules adenosine triphosphate (ATP) and nicotinomide???adenine dinucleotide phosphate (NADPH). Standard free energy change. Photosynthesis converts ?? 1/4 200 billion tonnes of CO 2 into complex organic compounds annually and produces

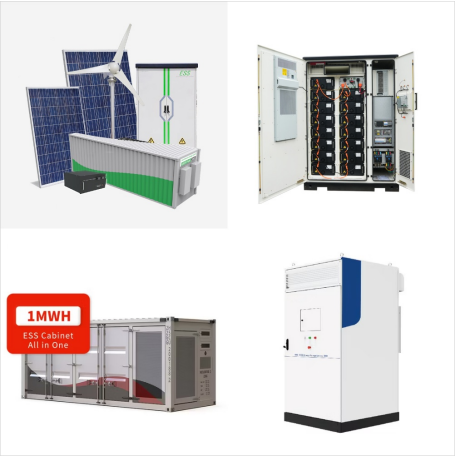
ENERGY STORAGE MOLECULES IN PHOTOSYNTHESIS



Photosynthesis is the main process which drives life on Earth. Through photosynthesis, energy from the sun is captured in the bonds of organic molecules. These molecules, glucose molecules, are the basis of all life on Earth. Glucose will be used by the process of cellular respiration to harness chemical energy stored within the covalent bonds



Predominantly, the term "photosynthesis" alludes to oxygenic photosynthesis, characterized by the production of oxygen as a byproduct and the storage of some resultant chemical energy within carbohydrate molecules, including sugars, starch, and cellulose.



After the process is complete, photosynthesis releases oxygen and produces carbohydrate molecules, most commonly glucose. These sugar molecules contain the energy that living things need to survive. Figure (PageIndex{4}): Photosynthesis uses solar energy, carbon dioxide, and water to release oxygen and to produce energy-storing sugar molecules.

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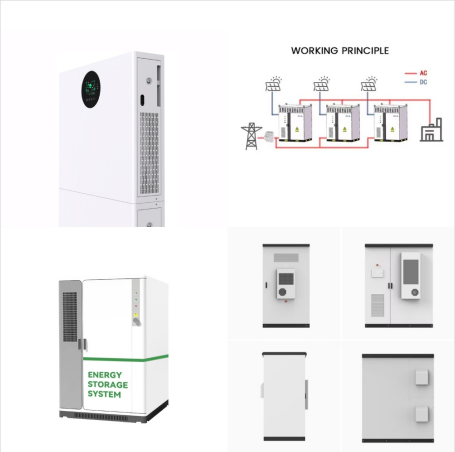
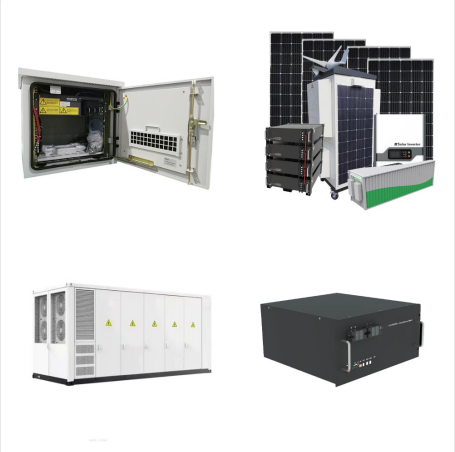
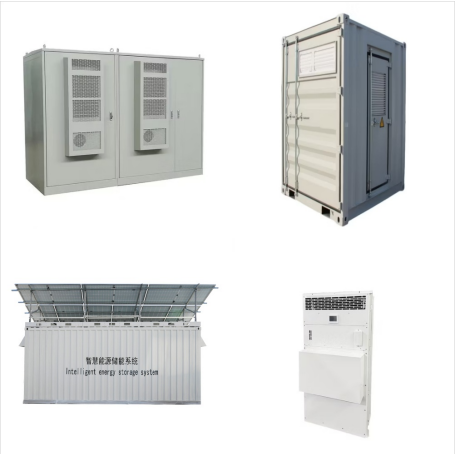


All living things require energy. Carbohydrates are storage molecules for energy. Living things access energy by breaking down carbohydrate molecules during the process of cellular respiration. Photosynthesis absorbs energy from sunlight to build carbohydrates in the chloroplasts, and aerobic cellular respiration releases that stored energy

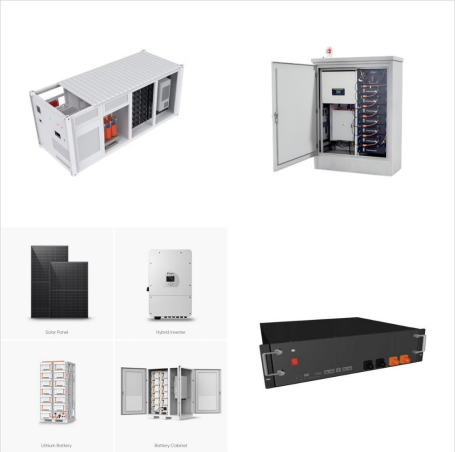


High-energy phosphate molecules adenosine triphosphate and the reducing agent NADPH are produced with the help of electron transport chain; 2) The Light-independent or Dark Reaction Ans. Photosynthesis is an energy-requiring process occurring only in green plants, algae, and certain bacteria that utilizes carbon dioxide and water to produce

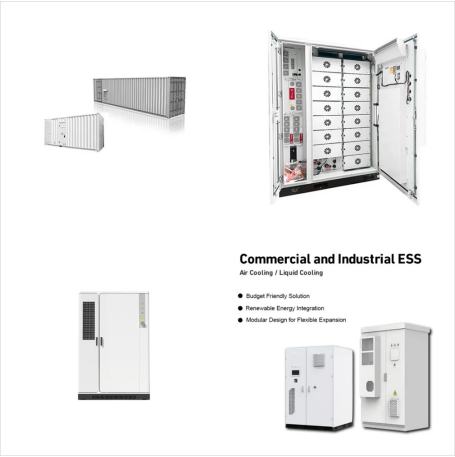


During photosynthesis, plants use energy (originally from sunlight) to convert carbon dioxide gas (CO 2) into sugar molecules (like glucose: C 6 H 12 O 6). They consume carbon dioxide and produce oxygen as a waste product. This reaction is summarized as: In contrast, energy-storage molecules such as glucose are consumed only to be broken

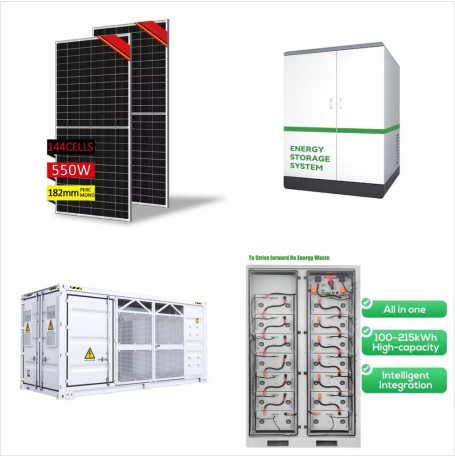
ENERGY STORAGE MOLECULES IN PHOTOSYNTHESIS



Photosynthesis is a multi-step process that requires sunlight, carbon dioxide (which is low in energy), and water as substrates (Figure 3). After the process is complete, it releases oxygen and produces glyceraldehyde-3-phosphate (GA3P), simple carbohydrate molecules (which are high in energy) that can subsequently be converted into glucose, sucrose, or any of dozens of other ???



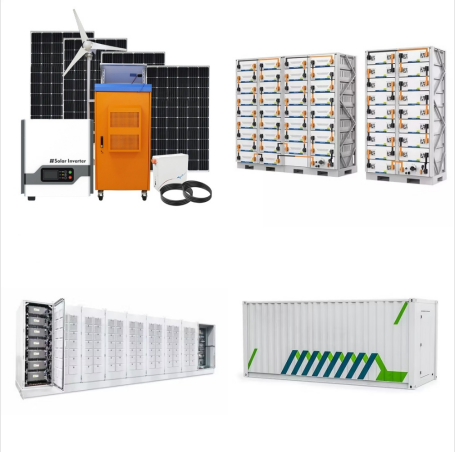
Many tasks that a cell must perform, such as movement and the synthesis of macromolecules, require energy. A large portion of the cell's activities are therefore devoted to obtaining energy from the environment and using that energy to drive energy-requiring reactions. Although enzymes control the rates of virtually all chemical reactions within cells, the equilibrium ???



Ask the Chatbot a Question Ask the Chatbot a Question adenosine triphosphate (ATP), energy-carrying molecule found in the cells of all living things. ATP captures chemical energy obtained from the breakdown of food molecules and releases it to fuel other cellular processes.. Cells require chemical energy for three general types of tasks: to drive metabolic reactions that ???

ENERGY STORAGE MOLECULES IN PHOTOSYNTHESIS

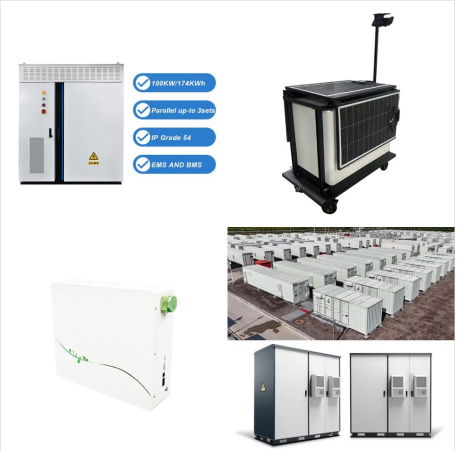
Carbohydrates are storage molecules for energy. Living things access energy by breaking down carbohydrate molecules during the process of cellular respiration. Plants produce carbohydrates during photosynthesis. Figure 2 The energy stored in carbohydrate molecules from photosynthesis passes through the food chain. The predator that eats



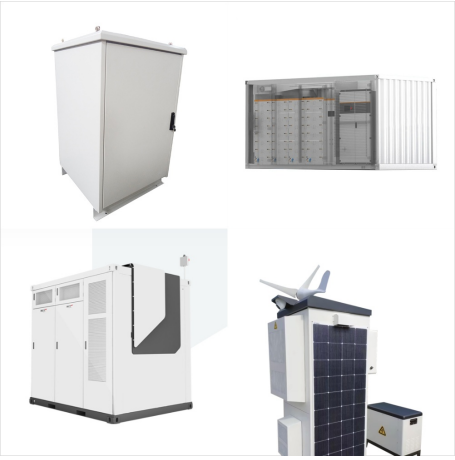
Living organisms use two major types of energy storage. Energy-rich molecules such as glycogen and triglycerides store energy in the form of covalent chemical bonds. Cells synthesize such molecules and store them for later release of the energy. The second major form of biological energy storage is electrochemical and takes the form of gradients of charged ions ???

The formula that describes photosynthesis is 6CO2 + 6H20 + light energy = C6H1206 + 602. What this chemical equation means is that photosynthesis combines light energy with six molecules of carbon dioxide and six molecules of water to produce six molecules of oxygen and one molecule of sugar.

ENERGY STORAGE MOLECULES IN PHOTOSYNTHESIS



During photosynthesis, energy from sunlight is harvested and used to drive the synthesis of glucose from CO2 and H2O. By converting the energy of sunlight to a usable form of potential chemical energy, photosynthesis is the ultimate source of metabolic energy for all biological systems. Photosynthesis takes place in two distinct stages. In the light reactions, energy from ???



Recall that the overall equation for photosynthesis is: water + carbon dioxide -> oxygen, water, and simple sugars. 12H 2 0 + 6CO 2-> 6O 2 + 6H 2 O + C 6 H 12 O 6. This equation is made up of two parts called half-reactions.The first half-reaction is an equation summarizing the Light Reaction, where energy from sunlight is used to split water molecules into oxygen gas, some ???