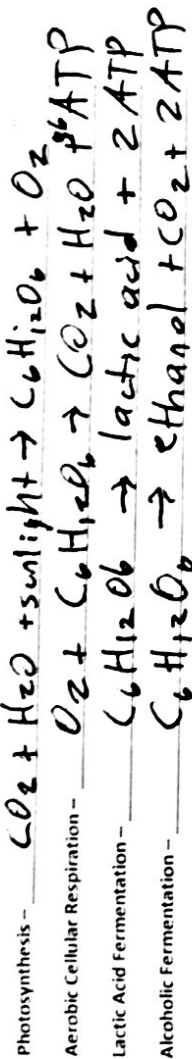


Cell Energy CFA

Write in your equations for the following to help guide you with the answers:



The set up contains an aquatic plant in a sealed test tube filled with water. The gas levels in the water were measured. The oxygen level measured at the beginning of the experiment is 50% and the carbon dioxide level is also 50%. After 24 hours of light, the oxygen and carbon dioxide levels are measured again.

1. What happened to the carbon dioxide levels after 24 hours in the light? (circle one)

Went up

Went down

Stayed the same

2. What happened to the oxygen levels after 24 hours in the light? (circle one)

Went up

Went down

Stayed the same

3. Explain what is happening during this time period to cause these changes.

photo \rightarrow CO_2 input & O_2 output
 The same setup as above was used, but now the plant is placed in the dark. No photo

4. What happened to the carbon dioxide levels after 24 hours in the dark? (circle one)

Went up

Went down

Stayed the same

5. What happened to the oxygen levels after 24 hours in the dark? (circle one)

Went up

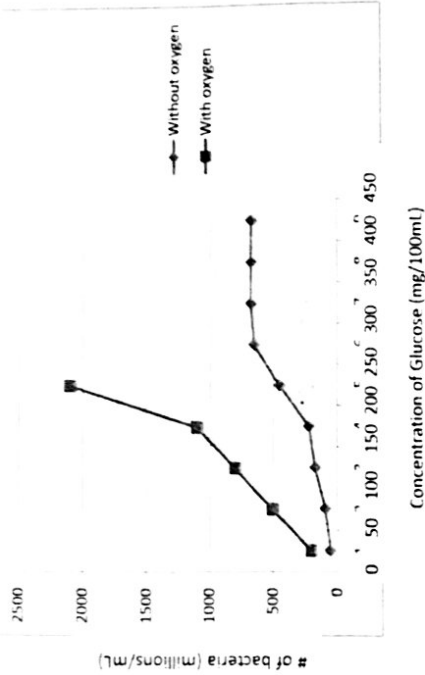
Went down

Stayed the same

6. Explain what is happening during this time period to cause these changes.

No sunlight for photosynthesis

The effect of glucose concentration and aerobic versus anaerobic conditions on the number of bacteria.



7. Are there more bacteria in aerobic or anaerobic conditions? Explain why.

anaerobic

8. Under anaerobic conditions what type of fermentation are the bacteria undergoing?

alcoholic fermentation

9. Bubbles were seen being released from both sets of test tubes. What was the gas that was produced?

CO_2

10. Animal cells, like ours do not undergo this type of fermentation. What type of fermentation do animal cells undergo?

lactic acid

11. What is the useable energy that is formed during cellular respiration?

ATP

2

12. How much more energy is formed in aerobic conditions in relation to anaerobic conditions?

more energy 36 ATP

13. Where is energy stored in ATP?

phosphate bond

14. How is the energy released from ATP?

phosphate bond is broken

2 32 36 ATP carbon dioxide cellular respiration electron transport chain	ethanol glucose glycolysis Kreb's lactic acid light light dependent	light independent oxygen photosynthesis water
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❖ Photosynthesis begins when 2 on light strikes a pigment molecule in the membrane of they thylakoid. This reaction is known as the light dependent reaction H₂O also enters during this first reaction and is split to form O₂ gas. The main goal of this reaction is to form two energy storing compounds to power the next step. In the next part of photosynthesis, the light independent reaction uses carbon atoms from carbon dioxide in the air, to produce glucose. The two main products of photosynthesis that go into cellular respiration are glucose and O₂.

❖ cellular respiration begins with the breakdown of glucose via glycolysis. In glycolysis, glucose is broken in half and the net gain of ATP's from this stage is 2 ATP. When oxygen is absent, fermentation produces lactic acid or ethanol and carbon dioxide and no additional ATP. When oxygen is present, aerobic respiration can occur and this process alone involves the Kreb cycle which yields 2 ATP's and the Electron transport chain which yields 32 ATP's for each glucose molecule. Therefore, in total, the net gain of ATP from the aerobic breakdown of one glucose molecule is 36 ATP.

Label the picture below. What gas is in the top of the test tube and what bubbles are being produced as a result of the experiment?

