

Sec.: _____ Name: _____

Experiment: The Role of Decomposers in The Environment (B. Science 10-9-1d)

Purpose: To learn of the role of decomposers in the environment by looking at the activity of yeast cells.

Materials: yeast (functioning)

Methods:

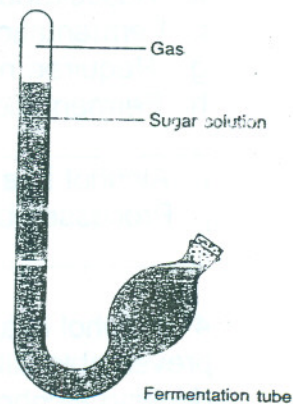
1. A fermentation tube is a tube that can be stoppered and collects the gas given off by organisms.
2. Three different fermentation tubes were set up. Tube 1 is the control which contains 40 mL of distilled water. Tube 2 is experimental with 40 mL of a low concentration of sucrose. While tube three is another experimental with 40 mL of a high concentration of sucrose. A yeast suspension was added. Each fermentation tube was

stoppered to trap the gases inside.

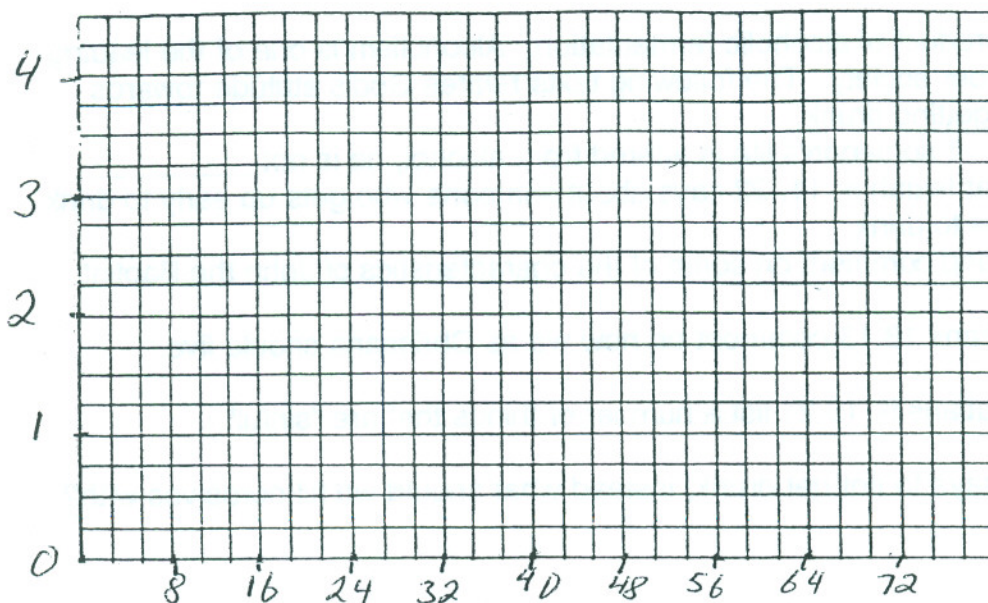
4. They were placed in a warm place (25 - 30 °C) for 3 days. The tubes were examined every 8 hours to note the volume of gas produced.
5. Results for the 3 tubes are recorded in the results section.
6. Plot graphs of volume (y axis) versus time (x axis) for each mixture. Label each of the lines as to which tube they represent.

Results:

tube	0 hr.	8 hr.	16 hr.	24 hr.	32 hr.	40 hr.	48 hr.	56 hr.	64 hr.	72 hr.
1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1 mL
2	0.0	0.1	0.2	0.3	0.4	0.45	0.50	0.55	0.60	0.70 mL
3	0.0	0.2	0.5	0.9	1.4	1.9	2.2	2.7	3.2	3.9 mL



Volume (mL)



time (hrs)

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Conclusions:

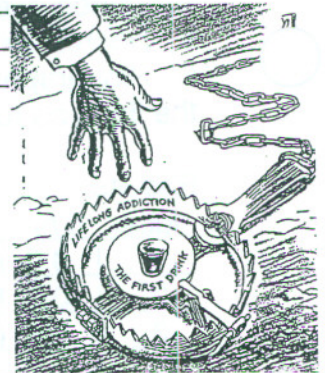
1. What purpose is served by the mixture in tube 1?
2. What gas is formed in this experiment?
3. How could you test your idea of what gas is present?
4. Was oxygen present for the yeast to live off of?
5. If oxygen gas was not present, what chemical process occurred to allow the yeast to obtain its energy?
6. Write out the chemical reaction for this (question 5)

Discussion:

1. Why would some decomposers need to be anaerobic organisms?
2. What does this investigation tell you about the role of decomposer organisms in the environment?
3. In the space provided, write the term from the following word bank that best fits the description. Some terms are used more than once.

anaerobic glycolysis lactic acid fermentation alcoholic fermentation

- a. Important to bakers and brewers: _____
- b. A great deal of energy is extracted from glucose: _____
- c. Causes a painful, burning sensation in muscles: _____
- d. Produces 2 ATP molecules and pyruvic acid: _____
- e. Associated with rapid exercise: _____
- f. Fermentation that occurs in yeast cells: _____
- g. Requires no oxygen: _____
- h. Fermentation that occurs in muscle cells that do not have sufficient oxygen: _____
- i. Alcohol is a by - product: _____
- j. Processes by which pyruvic acid is the final electron acceptor (2 answers):



4. Alcohol is a by - product of alcoholic fermentation. Alcoholism is one of the leading preventable killers in our society. The following texts relates God's attitude towards drinking alcohol and getting drunk.

- 4a. Read Prov. 20:1. If someone's life is altered from alcohol, he is not _____.
- 4b. Comment on what Isaiah 5: 11, 22 says about someone who gets up early to drink and even stays up late to drink.
- 4c. Read Luke 1:15 and comment on some of the characteristics of John the Baptist.
- 4d. According to Romans 13:13 comment on how we as Christians should live.
- 4d. According to Galatians 5: 19-21 list a number of things that are "sinful".
- 4e. Ephesians 5:18 says to not get drunk, instead what should we fill ourselves with?