

Name _____

Section _____

Metabolism in Yeast

Experiment # 12

Pre-Lab Exercise

1. How would you classify the enzyme lactate dehydrogenase in terms of the enzyme classification scheme described in the text book, *i.e.*, oxidoreductase, transferase, hydrolase, lyase, isomerase, or ligase?
2. How would you classify the enzyme, alcohol dehydrogenase?
3. Methylene blue is a dye that is used in this experiment as an indicator for oxidation and reduction. What color is methylene blue in the oxidized state?

What color is methylene blue in the reduced state?

4. Boiling yeast may result in these organisms no longer being able to metabolize nutrients. Explain what may be destroyed as a result of boiling.

5. Yeast are used to make beer and wine, producing alcohol in the process. In this experiment you will be adding alcohol to the yeast and a reaction will take place; the yeast will be metabolizing the alcohol, *i.e.*, consuming it. What are the conditions needed for yeast to produce alcohol and what are the conditions needed to get yeast to consume alcohol? [Hint: If fermentation takes place in air, one gets vinegar instead of wine].
6. Cyanide is a poison for humans as well as many other aerobic organisms. What is meant by aerobic?

How does cyanide act as a poison? You can find discussion of this poison in your text book regarding enzyme inhibitors.

Name _____ Section _____

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| <p>Carbohydrate Metabolism in Yeast Experiment #12</p> | <p>Data & Report Sheet</p> |
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Lactic Acid Dehydrogenase and Alcohol Dehydrogenase Reactions in Yeast

| | Observations (Color) | |
|------------------------------|----------------------------|----------------------|
| | After 10 min in water bath | After shaking in air |
| 5% Na lactate + boiled yeast | | |
| 5% Na lactate + KCN | | |
| 5% Na lactate | | |
| Blank, distilled water | | |
| 5% Ethanol | | |

Questions:

1. What accounts for the differences in your observations between the blank tube containing yeast with no substrate and the tube containing 5% sodium lactate or 5% ethanol. Why does sodium lactate or ethanol result in the loss of color in this tube?

3. What is causing the blue color to reappear in the tubes after shaking them? Do all of the tubes regain the blue color? If not, explain why not.