**Cellular Respiration Lab Report**

**General Concepts**

1. What are the commercial products produced by fermentation or anaerobic respiration? List at least two.

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| **Bread, Alcohol** |

1. What is the purpose of respiration?

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| Process of breaking down molecules into simpler molecules and storing the chemical energy that is released in molecules of adenosine triphosphate, ATP |

1. What are the differences between anaerobic and aerobic respiration?

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| Anaerobic Respiration means living and being active without the presence of oxygen. Aerobic Respiration means living and being active with the presence oxygen depending on free oxygen |

1. Why do disaccharides produce more CO2 than monosaccharides?

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| There is more energy available in the disaccharides and it has more carbon |

**Experiment-Specific Questions**

**Digestion of Individual Sugars by Yeast Cells**

1. For each of the sugars fermented by yeast, fill in the chart below to determine CO2 production?

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| **Results Table** | | | |
| **Sugar** | **Initial Gas Volume t=0 minutes (mL)** | **Final Gas Volume t=5 minutes (mL)** | **Volume of CO2 produced Final - Initial (mL)** |
| **Glucose** | **50.5** | **55.2** | **4.7** |
| **Fructose** | **0.0** | **1.3** | **1.3** |
| **Maltose** | **0.02** | **5.2** | **5** |
| **Maltotriose** | **0.0** | **0.9** | **0.9** |

1. For each of the sugars fermented by yeast, fill in the chart below to determine the mg of sugar consumed per minute during fermentation.

where P is the atmospheric pressure in the lab, V is the volume in liters of CO 2 , n is the number of moles of CO 2 , R is the gas constant 0.082 L-atm/mole-Kelvin, and T is the temperature in Kelvin. •

To calculate the moles of sugar consumed use the following equation. m = n / 2 s where m is the number of moles of sugar consumed, n is the number of moles of CO 2 produced, and s is the number of simple sugars in that sugar.

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| **moles of sugar consumed = moles of CO2 produced ÷ (2  × number of simple sugars in that sugar)** |

* + to calculate the moles of sugar consumed
  + Use

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| **mg of sugar per minute = (moles sugar) × (MW g/mole) × (1000 mg/g) ÷ (5 minutes)** |

* + to calculate the mg of sugar fermented per minute

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| **Calculations Table** | | | |
| **Sugar** | **Moles of CO2 produced** | **Moles of Sugar Consumed** | **Mg of sugar/min** |
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1. Based on your results, which sugars should be provided to yeast grown commercially to minimize the amount of sugar that needs to be purchased?

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