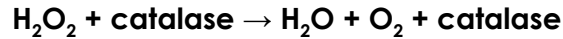


Lab 8: Enzymes Data Sheet

This lab will use the enzyme catalase and the substrate hydrogen peroxide. Catalase was one of the first enzymes discovered, and was named after its function - a catalyst.



One way to measure the reaction rate of this chemical reaction is to measure the amount of oxygen produced. Since we don't have an oxygen sensor available, we will measure the reaction rate visually and assign a qualitative value;

0 = no bubbling **1= small bubbles** **2= several bubbles** **3= rapid bubbling**

Part I: Mixing Enzyme & Substrate (CONTROL CONDITION)

Hypothesis: If catalase is present, then the reaction will _____,
because _____.

Manipulated Variable = _____

Responding Variable = _____

Controlled Variables = _____

Procedure:

1. Put 10 drops of hydrogen peroxide in a test tube.
2. Add 5 drops of catalase solution to the test tube.
3. Note what happens inside the test tube. Record this as a number for the reaction rate.
4. Feel the bottom of the test tube and record your observation.
5. Dump solution in the waste container (NOT down the sink) and CLEAN the test tube (use test tube brushes).

Data

Tube	Contents	Results
A	catalase + H_2O_2	

Part II: What Effect Does Heat Have on Enzyme Function?

Hypothesis: If catalase is heated, then the amount of oxygen bubbles will _____,
because _____.

Manipulated Variable = _____

Responding Variable = _____

Controlled Variables = _____

Procedure:

1. Using six clean test tubes, label three of them "A", "B", and "C". Do not mark the other three.
2. To each of the labeled tubes, add 5 drops of the catalase solution.
3. Put tube A in boiling water bath (100 °C), put tube B in warm water bath (37 °C), and put tube C in an ice bath (0 °C).
4. Wait 4 minutes. While you wait, add 10 drops of hydrogen peroxide solution to each of the three unmarked test tubes.

5. After 4 minutes, remove the tubes from their baths and put them in a test tube rack.
6. AT THE SAME TIME, add the contents of the unmarked tubes to each of the other tubes.
7. Observe and record your results.
8. CLEAN ALL SUPPLIES.

Data

Tube	Temp	Results
A	100 °C	
B	37 °C	
C	0°C	

Part III: What Effect Does pH Level Have on Enzyme Function?

Hypothesis: If **an acid** is added to catalase, then the amount of oxygen bubbles will

_____, because _____

Hypothesis: If **a base** is added to catalase, then the amount of oxygen bubbles will

_____, because _____

Manipulated Variable = _____

Responding Variable = _____

Controlled Variables = _____

Procedure:

1. Using six clean test tubes, label three of them "A", "B", and "C". Do not mark the other three.
2. To each of the labeled tubes, add 5 drops of the catalase solution.
3. Add 5 drops of distilled water to tube A, add 5 drops of the acid solution to tube B, and add 5 drops of the base solution to tube C. Measure and record the pH level of each test tube using the pH strips.
4. Add 10 drops of hydrogen peroxide solution to each of the three unmarked test tubes.
5. AT THE SAME TIME, add the contents of the unmarked tubes to each of the other tubes.
6. Observe the results and BE SURE TO NOTE THE RATE OF EACH REACTION! Record your results.
7. CLEAN AND RETURN ALL SUPPLIES. Wash your hands and table.

Data

Tube	Contents	pH Level	Results
A	distilled water		
B	acid solution		
C	base solution		