

Name: _____ Per: _____ Date: _____

Lab: Enzymes – Catalase in action!

Honors Bio

Prelab-

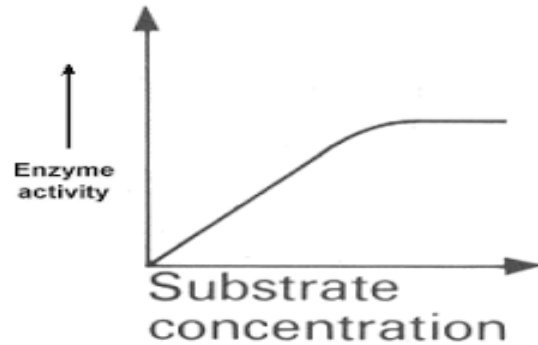
A _____ is a chemical that speeds up a reaction by breaking or forming chemical bonds. An example in *living* organisms is _____, which is a kind of _____ (a type of protein with a highly-specific structure). One of the functions of this enzyme is to break down hydrogen peroxide _____ that is continually being produced by your _____ as a result of regular metabolic activity. The problem is that hydrogen peroxide is a _____ and will damage your cells if it's not broken down quickly. In this investigation you will observe the activity of catalase using the organisms _____ and _____, and their ability to breakdown the _____ hydrogen peroxide into _____ and _____.

Enzyme	Substrate	Cells	Yeast
Poison	Catalyst	H ₂ O ₂	Potato
Water (H ₂ O)	Oxygen Gas (O ₂)	Catalase	

Materials/Methods:

"Ingredients" in trial	Predicted Results:	Actual Results	Explanation of results
1) ___ ml of Yeast (contains catalase) + ___ ml of H ₂ O ₂			
2) ___ ml of BOILED yeast + ___ ml of H ₂ O ₂			
3) ___ ml of Yeast (contains catalase) + ___ ml of NaOH (pH =12) (wait 1 min) + ___ ml of H ₂ O ₂			
4) ___ ml of Yeast (contains catalase) + ___ ml of H ₂ O ₂			
5) ___ ml of Yeast (contains catalase) + ___ ml of H ₂ O			
6) ___ ml of potato sol. + ___ ml of H ₂ O ₂			
7)			

1. Record the balanced decomposition reaction (chemical equation) of hydrogen peroxide. List its products and reactants. Balance the equation:
2. Explain the evidence that proves H_2O_2 decomposed when exposed to liver.



3. The graph above depicts the typical enzyme activity as substrate concentration increases. Explain why we wouldn't observe a continual increase in enzyme activity as substrate concentration increases:
4. Describe two additional experiments that would render the enzyme catalase useless (how could you prevent a reaction occurring when catalase and hydrogen peroxide are mixed).
5. **Diagram** – Diagram the correct enzymatic reaction that should take place. Show three different phases of the reaction. Label: the *enzyme* (_____), the *substrate* (_____), the *enzyme substrate complex*, and the *products* (_____, _____)