**Biology 12 Chp.14**

**LACTASE ENZYME LAB: Conclusion and questions**

**Data table:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Tube** | **Contents** | **Observations** | **Presence of Glucose (+ or -)** |
| **A** |  |  |  |
| **B** |  |  |  |
| **C** |  |  |  |
| **D** |  |  |  |
| **E** |  |  |  |

1. Diagram and describe the lactose and lactase reaction.
2. Why did the enzyme react to lactose but not to sucrose?
3. What happened when the enzyme was boiled?
4. Another way to affect the enzyme is by lowering the pH of the solution. However, lactase is supposed to be able to work in the stomach. Would lowering the pH of the enzyme solution affect the enzyme? Why or why not?
5. What type of reaction is this? Dehydration or hydrolysis?

**CONCLUSION**:

The complete activity can also be found on the attached [Lactase Enzyme Lab](http://www.learnnc.org/lp/media/lessons/BertWartski8222002227/LBB3LACT.txt).

**Assessment**

Teachers will be able to assess the result table (the only positive reaction should be test tube A) and the teacher will be able to correct the conclusion questions.

1. The students should draw a hydrolysis-induced fit model.
2. The shape of sucrose (glucose and fructose) is different from lactose (glucose and galactose). The sucrose will not fit into the active site of lactase.
3. The enzyme denatured. The hydrogen atoms vibrated so much due to the energy added to the system that the hydrogen bonds broke changing the secondary, tertiary, and quaternary structure of the enzyme. Note: as long as the students understand that the bonds broke changing the enzyme shape, they are ok.
4. The enzyme will denature (eventually). The H+ will interfere with the hydrogen bonds, and denature the enzyme.
5. This reaction is a hydrolysis reaction.

**Supplemental information**

\*\*\* **Be sure to boil for at least 30 minutes to denature.**

**\*\*\* Positive glucose test with test paper is the paper turns from yellow to green or dark green/blue with even more glucose present.**