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**HOW DO SUBSTRATE CONCENTRATION AND PH AFFECT ENZYME – CONTROLLED REACTION?**

**Date**: November 12, 2016

**Honor code**: On my honor, I have neither received nor given any unauthorized aid on this assignment.

**INTRODUCTION**

Lactase is an enzyme produced by many organisms which located in the brush border of the small intestine of humans. It is important because people body can’t absorb lactose. Lactase enzymes help people to digest this. Lactase breaking down the lactose into smaller, easier to digest which called glucose and galactose.

**DATA**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Amount of substrate | pH3 | pH5 | pH7 | pH9 | pH11 |
| 0.5g | 19 | 39 | 72 | 45 | 24 |
| 1.0g | 39 | 81 | 145 | 91 | 49 |
| 2.0g | 82 | 168 | 300 | 189 | 103 |
| 4.0g | 96 | 196 | 350 | 223 | 121 |
| 8.0g | 96 | 198 | 350 | 223 | 121 |

**DISCUSSION**

1. The relationship is linear. As the substrate concentration increases, the reaction rate will also rising up because there is more substrate for the enzyme to react with.
2. The maximum initial reaction rate for the lactase enzyme at pH 7 is 350x106 molecules formed per minute.
3. The maximum initial reaction rate can’t be reached at low lactose concentrations because of the exhaustion of the substrate so it wouldn’t have enough enzymes to react on.
4. My data indicated that the optimum pH level for this lactase – catalyzed reaction is pH7 because in this trial, enzymes produce the most products.
5. Temperature plays an important role on this reaction because it affects the enzymes ability to function and react. If this reaction is happen in the wrong temperature, the reaction rate can get damaged.
6. Special consideration that the producer of this product need to be concerned about the pH of the lactase should be stay neutral ( pH7), not too much acidic or too base. If the products are too acidic or too base, the people who consume this will hardly to digest it.