

(Revised) Enzyme Lab Analysis and Conclusion Responses

Suppose you had dipped a filter paper disk in a 30% potato extract solution. Using the graph, predict how long it would take this disk to rise to the top of a beaker of H_2O_2 .

If we had dipped the filter paper disk in 30% potato extract, I predict that it would have risen in about 42 seconds, according to our trend line (about $\frac{1}{3}$ of the way between the 25% and the 50%).

How does the concentration of the enzyme affect the rate of the breakdown of hydrogen peroxide? Use the results of this experiment to justify your answer.

We noticed that the higher the concentration of the enzyme catalase of potato extract, the faster the hydrogen peroxide breaks down, and the faster the byproduct O_2 bubbles form and push the disk up faster. The graph shows this very clearly, with each increase in concentration leading to a decrease in time of the bubbles to raise the paper disk. With no catalase, the paper disk didn't rise (in a ten-minute time-frame), the 25% potato solution took 57 seconds, followed by the 50% of 21 seconds, the 75% of $14\frac{2}{3}$ seconds, and the 100% with $12\frac{2}{3}$ seconds. In other words, the disk dipped in 25% potato solution took $4\frac{1}{2}$ times as long as the 100% potato extract, which is a huge difference.

Our data also suggests that the concentration of catalase and breakdown of the H_2O_2 is not a linear relationship. Instead, it looks exponential, with a smaller change between each interval. This means that when a high concentration of enzyme is present, then changing the concentration would be insignificant. This can be seen in our graph, because the change between the 75% and the 100% is only 2 seconds, while the change between the 25% and the 30% is 36 (18 times as much). From this I can conclude that enzymes cannot make a reaction instantaneous, and it can only increase the speed of a reaction to a certain point.