

# Effects of changing the temperature of catalase during reaction biology essay



For each reaction test, the sum of O produced, concluding temperature of solution, concluding volume of solution, and entire reaction clip were recorded. The sum of O produced was found by detecting the sum of H<sub>2</sub>O displaced in the 100 milliliter graduated cylinder that was in the pneumatic trough. The concluding temperature of the solution was found by utilizing a thermometer to happen the temperature of the solution right after the reaction had taken topographic point. The concluding volume was found by first taking the 100 milliliter graduated cylinder out of the trough and emptying it. Then the concluding solution was transferred from the Erlenmeyer flask into the 100 milliliter graduated cylinder where the volume was recorded. The entire reaction clip was recorded by utilizing a halt ticker, get downing when the H peroxide was first assorted with the liver, and stopped when no more H<sub>2</sub>O was being displaced out of the 100 milliliter graduated cylinder.

The consequences for this experiment showed assorted things. First, the consequences for this experiment ab initio went against the hypothesis, where all the reacting variables were higher for the hypothermic and hyperthermic temperatures. When the information was manipulated nevertheless, to demo the efficaciousness of O production, the consequences were in favour of the control variable at human organic structure temperature.

This can be seen in Graph 1, as the temperature increases, there is an addition in the efficaciousness of O production until 37 & A ; deg ; C ± 0.5 & A ; deg ; C where the efficaciousness once more starts to worsen. These consequences show that though the rate of O production were highest at <https://assignbuster.com/effects-of-changing-the-temperature-of-catalase-during-reaction-biology-essay/>

somewhat hyperthermic and somewhat hypothermic temperatures, more of the reactants were used in the procedure in comparing to the sum used at human organic structure temperature. This relationship between the volumes of reactants used to the temperature of the Catalase can be seen in Graph 2. Therefore, there was a higher efficaciousness in the reaction at normal human organic structure temperature ( 37 & A ; deg ; C ) since there was a higher rate of O production at a much lower sum of Catalase being reacted.

## **Data Comparison**

These consequences agree with other resources and experiments.

Harmonizing to scientific research, the optimal temperature of Catalase is normal human organic structure temperature at around 37 & A ; deg ; C ( Chelikani, 2004 ) . As this temperature increases, Catalase is still able to respond expeditiously until 40 & A ; deg ; C, where the enzyme shows a important bead in reaction efficaciousness due to the denaturing of the protein at higher temperatures ( Chelikani, 2004 ) .

This research agrees with the efficaciousness of O production tendency in Graph 1, where it is highest at 37 & A ; deg ; C and so has a important bead at 40 & A ; deg ; C. The natural information for the responding variables in this experiment showed that the highest sums of reactants used were in hypothermic temperatures. This could be due to the fact that since Catalase is a biochemical enzyme, its katabolic reaction is a elusive and elegant biological reaction which reduces the sum of activation energy required for a reaction ( Sivrikaya, 2009 ) . Therefore, an optimal reaction of Catalase

reacts with minimum energy ingestion. However, other beginnings of <https://assignbuster.com/effects-of-changing-the-temperature-of-catalase-during-reaction-biology-essay/>

research province that the Catalase in poulet liver differs extremely from that of worlds ( Aydemir, 2003 ) . The beginning besides claims that Catalase in poulet red blood cells have an optimum temperature of 25 & A ; deg ; C in experiments ( Aydemir, 2003 ) . This could explicate why the experiment still had high sums of O productions at 25 & A ; deg ; C, which was in this instance being tested as utmost hypothermia.

## **Beginnings of Mistake**

One big beginning of mistake could hold been the beginning of Catalase.

Since Catalase can come from a assortment of beginnings, utilizing chicken liver may non hold been the best pick. The pick of the beginning of Catalase in this experiment was to pattern Catalase in the human organic structure in order to detect alterations of the reaction in different human organic structure temperatures. Chicken liver nevertheless, may non hold been the most efficient at patterning Catalase reactions in human organic structure conditions ; this anticipation besides backed up by other scientific research ( Aydemir, 2003 ) . For a much more accurate experiment, a Catalase sample would be required from the human organic structure, of class nevertheless this is really improbable.

Alternatively, more in depth research could hold been done to happen a better theoretical account of human liver. Using cow liver would hold been a somewhat better alteration to overawe liver, nevertheless still non a perfect lucifer. This would hold perchance given more consistent information, better patterning that of the human organic structure. Another beginning of mistake was keeping the temperature of the Catalase. The method in this

experiment brought the Catalase to a certain temperature but did not let for the enzyme to keep the temperature long enough to make an important alteration. A rectification to this would have been to convey the H<sub>2</sub>O to the increment temperature alternatively, and while keeping the H<sub>2</sub>O temperature, adding the closed Erlenmeyer flask of liver into the H<sub>2</sub>O for about 5-10 proceedings. This would have allowed the enzyme to go more denaturalized at higher or lower temperatures, severally.

### **Decision:**

The hypothesis for this experiment was proven incorrect, production of O<sub>2</sub> and reaction time were in fact lowest for the normal human organic structure temperature of 25 °C.

However, the manipulated information found in Table 1, showed that since the O<sub>2</sub> production rate compared to amount of reactants used was highest at 37 °C, it had a better efficiency so the other increases. The consequences nevertheless, failed to demonstrate important alterations in hypothermic temperatures. On the other hand, the information showed a moderate lessening in enzyme efficiency and rate of O<sub>2</sub> production at utmost hyperthermic temperatures of 41 °C.