

Effect of enzyme catalase concentration on reaction rate assignment



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Enzymes are biological catalysts, large protein proteins that have a very specific three-dimensional shape which makes them highly specific and only work on one or a few similar chemical reactions. Enzymes themselves are not consumed in the reaction, but they help attract substrates into correct position to undergo chemical reaction. Enzymes greatly speed up the rate of biological reactions by lowering the energy of activation. To get a sense of the speed and efficiency of enzymes, substrates can be transformed to products at the rate of thousands of times per second with the enzymes.

If we consider the total number of different enzymes in the human body, which is estimated to be around 75, 000, these chemical reactions are performed at an amazing rate. On the other hand, in the absence of enzymes, reactants may take hundreds of years to convert into a product, if they are able to do so at all. This is why enzymes are crucial to life, without it life would not exist on earth. One of the many enzymes that are produced naturally within the body is catalase. In Denham Harman's free-radical theory of aging, it is theorized that cells age as a result of exposure to free radicals and oxidizing agent such as hydrogen peroxide.

Catalase is the major line of defense that converts hydrogen peroxide into water and oxygen, thus decreasing levels of free radicals in the body.

According to an article published online on May 6, 2005 by Scientific American Journal, Peter S. Rabinovitch et al. (2005), of the University of Washington and his colleagues engineered mice to produced higher-than-normal amounts of the enzyme catalase. The team reports that animals with higher levels of catalase in their mitochondria lived 20 percent longer on average than control animals did.

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