

AQA Biology A-level

RP01 - Rate of an Enzyme Controlled Reaction

Flashcards

What are the factors that affect enzyme activity (4)?

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1. Enzyme concentration
2. Substrate concentration
3. Temperature
4. pH

How is a control set up in a practical measuring enzyme activity?

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Replace the enzyme solution with distilled water or boiled enzyme solution.

How can the results of the practical measuring enzyme activity be used to find the initial rate of reaction?

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Plot your results on a graph of 'rate of reaction' against 'time'.

Draw a tangent at time = 0 to find the initial rate.

Outline the practical procedure used to measure the effect of temperature on enzyme activity, using trypsin and milk.

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Immerse equal volumes of trypsin and milk, stored in different test tubes, in a water-bath for 5 minutes for the temperature to equilibrate.

Mix together and immediately start timing, record the time taken for the milk to be completely hydrolysed (become colourless/same as the control standard set up).

Test at least 5 temperatures, with at least 3 repeats at each temperature.

How is the rate of reaction calculated from time?

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Rate of reaction = $1/\text{time}$

What is the effect of temperature on enzyme activity?

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As temperature increases, kinetic energy increases so more ES complexes form. The rate of reaction increases up to the optimum temperature.

Beyond that, bonds in the enzyme tertiary structure break, which changes the shape of the active site. The substrate and enzyme are no longer complementary, so rate of reaction decreases.

What is the risk and level of risk associated with handling enzymes?

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Students may have allergic reactions to enzymes, so avoid contact with skin and eyes, wear eye protection.

Low risk.