

CIE Biology IGCSE

5 - Enzymes

Flashcards



What is a catalyst?



What is a catalyst?

A substance which increases the rate of reaction without being used up or changed itself



What are enzymes?



What are enzymes?

Enzymes are biological catalysts that speed up the rate of metabolic reactions



Describe the structure of enzymes



Describe the structure of enzymes

Enzymes are proteins that contain a highly specific active site that fits a specific substrate



Why are enzymes necessary in biological systems?



Why are enzymes necessary in biological systems?

They speed up reactions so that less energy is needed for the reaction to occur



Describe enzyme action (Higher/Supplement)



Describe enzyme action (Higher/Supplement)

A substrate that fits the specific active site of the enzyme binds to create an enzyme-substrate complex, a reaction occurs (catalysed by the enzyme) and then the products are released



What does the statement 'enzymes are highly specific' mean?
(Higher/Supplement)



What does the statement 'enzymes are highly specific' mean? (Higher/Supplement)

The active site of the enzyme must bind to a substrate that has a complementary shape and so only specific reactions can be catalysed



State 4 factors that affect the rate of an enzyme-controlled reaction



State 4 factors that affect the rate of an enzyme-controlled reaction

- Temperature
- pH
- Substrate concentration
- Enzyme concentration

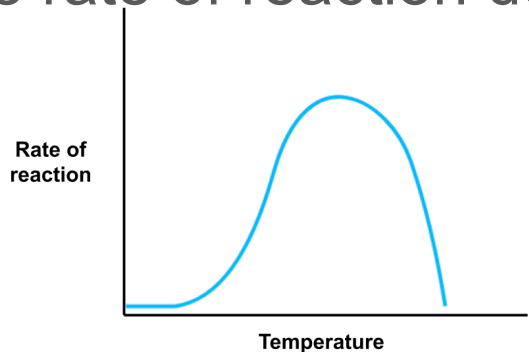


Describe the effect of temperature on the rate of an enzyme-controlled reaction



Describe the effect of temperature on the rate of an enzyme-controlled reaction

- As the temperature increases, so does the rate of reaction
- Once the temperature exceeds the optimum, the enzyme denatures and the rate of reaction decreases



Why does the rate of an
enzyme-controlled reaction increase
when the temperature increases?
(Higher/Supplement)



Why does the rate of an enzyme-controlled reaction increase when the temperature increases?

(Higher/Supplement)

- As the temperature increases the particles have more kinetic energy
- This increases the chance of collisions between molecules being successful and leading to a reaction



If temperature increases above the optimum, how does this affect enzyme function?
(Higher/Supplement)



If temperature increases above the optimum, how does this affect enzyme function?

(Higher/Supplement)

The active site will be distorted as the enzyme denatures and so it will no longer fit the substrate

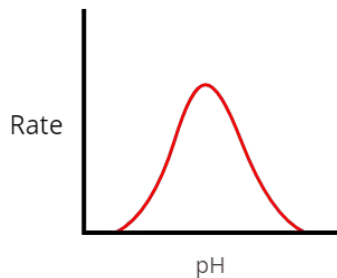


Describe the effect of pH on the rate of an enzyme-controlled reaction



Describe the effect of pH on the rate of an enzyme-controlled reaction

- The rate of an enzyme catalysed reaction is fastest at the optimum pH
- If the pH is too high or low, the enzyme will work less efficiently and the active site may be denatured at extremes of pH



How does a pH that is very different to the optimum affect enzyme activity?
(Higher/Supplement)



How does a pH that is very different to the optimum affect enzyme activity? (Higher/Supplement)

The change in pH will distort the enzyme's active site (denaturing it) so that it can no longer fit the specific substrate

