

WJEC Wales Biology GCSE

1.1 (i) to (l) - Enzymes

Flashcards

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What are enzymes?



What are enzymes?

They are biological catalysts. These biological catalysts increase the rate of a chemical reaction without being permanently changed themselves.



What is an advantage of enzymes in the body?



What is an advantage of enzymes in the body?

They enable cellular reactions to take place at lower temperatures



What group of chemicals do enzymes belong to?



What group of chemicals do enzymes belong to?

Proteins



Describe how DNA controls the production of a specific enzyme (**higher**)



Describe how DNA controls the production of a specific enzyme (**higher**)

- DNA codes for a specific sequence of amino acids
- The order of amino acids determines how the enzyme folds and its structure
- The shape of the enzyme determines its function



What is the chemical that an enzyme works on called?



What is the chemical that an enzyme works on called?

Substrate



What is the active site of an enzyme?



What is the active site of an enzyme?

The region of an enzyme to which a substrate molecule binds and the reaction takes place



Why are enzymes described as having a
'high specificity' for their substrate?



Why are enzymes described as having a 'high specificity' for their substrate?

Only substrates with a specific, complementary shape can fit into an enzyme's active site



What must happen between an enzyme and its substrate for a reaction to occur?



What must happen between an enzyme and its substrate for a reaction to occur?

Enzyme and substrate must collide



Describe the 'lock and key' model
(higher)



Describe the 'lock and key' model (higher)

1. Substrate collides with the active site of an enzyme
2. Substrate binds, enzyme-substrate complex forms
3. Substrate converted to products
4. Products released from the active site which is now free to bind to another substrate



What factors affect the rate of an enzyme-controlled reaction?



What factors affect the rate of an enzyme-controlled reaction?

- Temperature
- pH



Explain how increasing temperature initially affects the rate of an enzyme-controlled reaction



Explain how increasing temperature initially affects the rate of an enzyme controlled reaction

- As temperature increases molecules have more KE
- Movement of molecules increases
- Probability of a successful collision increases
- More enzyme-substrate complexes form
- Rate of reaction increases



Explain how increasing temperature above the optimum affects the rate of an enzyme-controlled reaction



Explain how increasing temperature above the optimum affects the rate of an enzyme controlled reaction

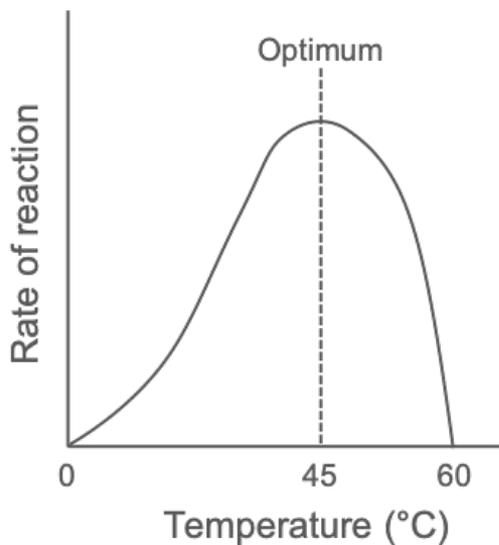
- Temperature increases above the optimum
- Increased vibrations break bonds in enzyme's structure
- Active site changes shape, enzyme is denatured
- No more enzyme-substrate complexes can form
- Rate of reaction decreases



Draw a graph to show the effect of increasing temperature on the rate of an enzyme-catalysed reaction.



Draw a graph to show the effect of increasing temperature on the rate of an enzyme-catalysed reaction.



Explain how pH affects the rate of an enzyme-controlled reaction



Explain how pH affects the rate of an enzyme controlled reaction

- Enzymes have an optimum pH
- pH shifts from the optimum
- Bonds in the enzyme's structure are altered
- Active site changes shape, enzyme is denatured
- Rate of reaction decreases



Draw a graph to show the effect of increasing pH on the rate of an enzyme-catalysed reaction



Draw a graph to show the effect of increasing pH on the rate of an enzyme-catalysed reaction

