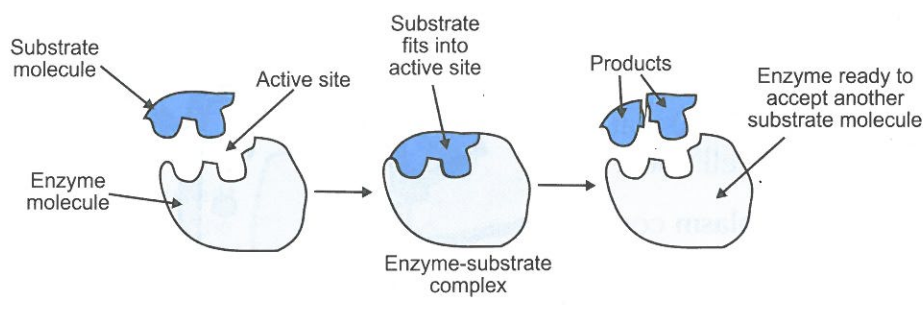


Enzymes

Enzymes have an Active Site

- 1) A substance that's acted upon by an enzyme is called its **substrate**.
- 2) The **active site** is a region on the surface of the enzyme molecule where a substrate molecule can attach itself. It's where the catalysed reaction takes place.
- 3) The shape of the substrate molecule and the shape of the active site are **complementary**, i.e. they fit each other.
- 4) Almost as soon as the **enzyme-substrate complex** has formed, the products of the reaction are released and the enzyme is ready to accept another substrate molecule.



Enzymes are Specific

- 1) An enzyme usually catalyses one **specific** chemical reaction.
- 2) The substrate molecule must be the **correct shape** to fit into the active site.
- 3) **Only one substrate** will be the correct shape to fit, so each enzyme only catalyses one specific reaction.
- 4) Anything that **changes** the shape of the active site will **affect** how well the enzyme works.

The Effect of Temperature on Enzyme Activity

As temperature **increases**, enzyme reactions become **faster**, because the molecules have more **energy**. However, at high temperatures the atoms of the enzyme molecule vibrate more rapidly and **break** the weak bonds that hold the **tertiary structure** together. The **shape** of the active site **changes** and the substrate can no longer fit in. The enzyme is said to be **denatured**.

The Effect of pH on Enzyme Activity

Acids and **alkalis** can denature enzymes. Hydrogen ions (H^+) in acids and hydroxyl ions (OH^-) in alkalis disrupt the **weak bonds** and change the shape of the active site.

Lonely enzyme seeking complementary substrate...

- 1) Why are enzymes described as 'specific'?
- 2) Explain why a denatured enzyme will not function.
- 3) Describe the effect of pH on enzyme activity.