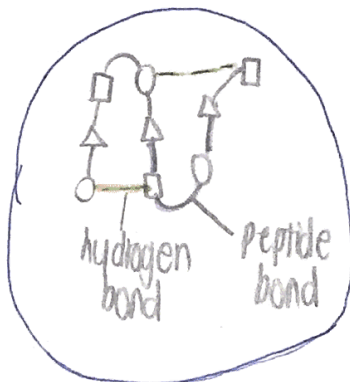


Catalyst (Substance that speed up/alter the rate of a reaction w/o being chem. changed at the end of reaction)

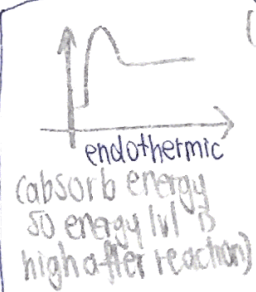
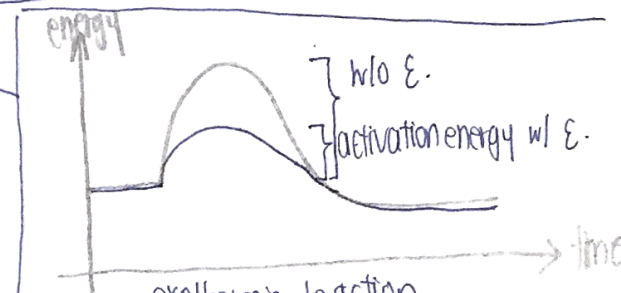
- Biological**
Enzymes (Protein)
Catalase
- Chemical**
Manganese(IV) oxide



Our body/cells produce E. that work at temp. below 45°C.
eg. $2H_2O_2 \xrightarrow{\text{enzyme}} 2H_2O + O_2$

Characteristics

- Speed up chem. reactions**
- By lowering activation energy
- Required in minute amts**
- Small amt. catalyse a big amt. of reactions
- Remains unchanged
- Can be used over & over again / repeatedly
- Highly specific in their actions**
- specific due to 3-D shape
- 1 enzyme \rightarrow 1 reaction



exothermic reaction
(release energy so lvl is low after reaction)

- Enzymes lower A-Energy req. to start chem. reaction.
- Bring S. into close proximity w/ e.o. & in correct orientation for reaction to occur
- \uparrow E-S complex & prod. formed/unit time

Thus \uparrow chemical reaction

FACTORS

- Affected by pH**
- Acid/Alkali denatures enzyme
- S. cannot bind to E's A.S.

- Affected by temperature**
- Acid/Alkali denatures enzyme
- S. cannot bind to A.S.
- \uparrow chances of effective collisions
- \uparrow E-S complex, \uparrow prod. @
- \uparrow rate of reaction

- Affected by substrate & enzyme conc.**

\uparrow E conc., \uparrow rate of reaction until a certain pt.
 \uparrow S. conc., \uparrow rate

* time is not a limiting factor as it does not take part in the reaction

- \uparrow K.E. of E
- vibrations so violent, breaks the peptide/hydrogen bonds in enzyme
- Lose its shape & A.S. / Denatured
- S. cannot bind to A.S. of E.

Classes

Hydrolases
- Break up complex mol. \rightarrow simpler mol. w/ water

(Redox) Oxi-Red. enzyme
- Breakdown glucose in cellular respiration

Reactions

Anabolic (Build up complex substance)
eg. A.A. \rightarrow Proteins
Glucose \rightarrow Starch
F.A. & Glycerol \rightarrow Fats

Catabolic (Breakdown complex substance)
eg. Digestion
1 substrate \rightarrow 2 or more prod.