

3 Enzymes – Part 1

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)		
enzyme	酶	_____	_____	_____
catalyst	催化剂	_____	_____	_____
lowering the activation energy	活化能	_____	_____	_____
active site	活性位点	_____	_____	_____
substrate	底物	_____	_____	_____
denatures	变性	_____	_____	_____
inhibitor	抑制剂	_____	_____	_____

Recall

You already know that living things use enzymes:

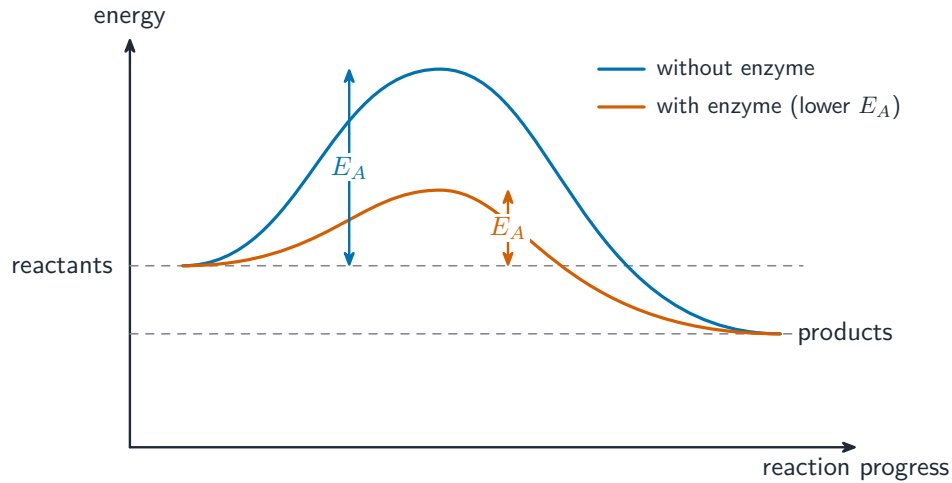
- Enzymes speed up the reactions in your body, like digesting food.
- They work best at a certain temperature (about body temperature) and pH.
- Too much heat “kills” an enzyme.

This sheet makes enzyme action exact. Each idea has a short worked example.

New ideas

■ 1 Enzymes lower the barrier

An **enzyme** 酶 is a protein **catalyst** 催化剂: it speeds up a reaction by **lowering the activation energy** 活化能, and is not used up.

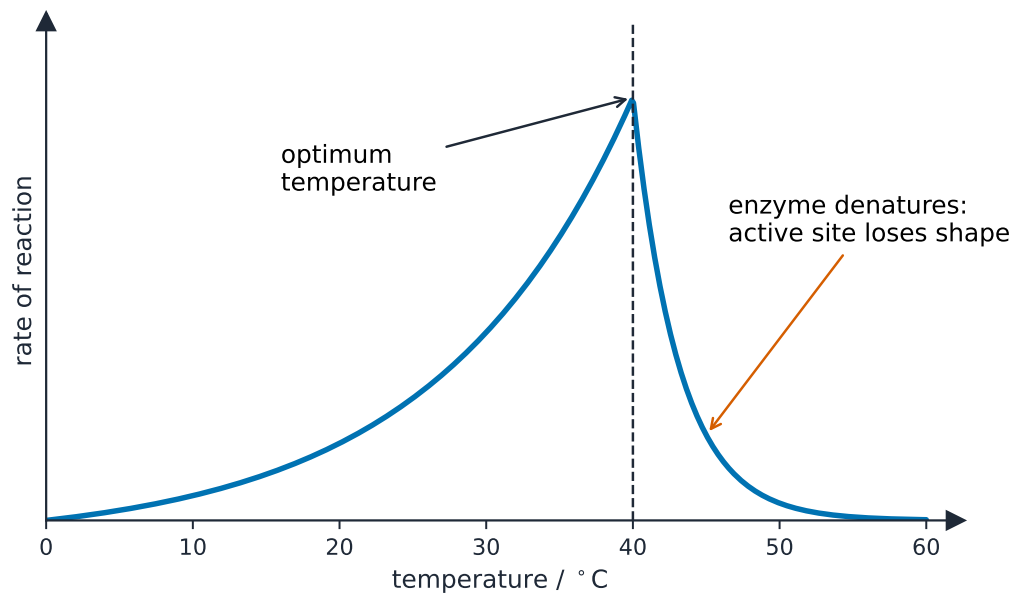


■ 2 The active site

Each enzyme has an **active site** 活性位点 shaped to fit one particular **substrate** 底物 – like a lock and key. This makes each enzyme highly **specific** to its reaction.

■ 3 Temperature and pH

Each enzyme has an **optimum** temperature and pH where it works fastest. Beyond that, the protein **denatures** 变性 (loses its shape) and stops working.



■ 4 Inhibitors

An **inhibitor** 抑制剂 slows an enzyme down – by blocking the active site, or by changing the enzyme’s shape.

Watch out: raising the temperature speeds an enzyme up only **up to its optimum**. Past that, the heat denatures the enzyme and the rate **drops** – unlike an ordinary reaction, which just keeps speeding up.

Practice

Try these in order. The methods are all above.

2.1 State how an enzyme speeds up a reaction. [2]

2.2 Explain why each enzyme only works on one particular substrate. [2]

2.3 State what happens to an enzyme when it is heated well above its optimum temperature. [2]

2.4 Sketch in words how the rate of an enzyme reaction changes as temperature rises from cold to very hot. [2]

2.5 State what an enzyme inhibitor does. [1]
