

# 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:

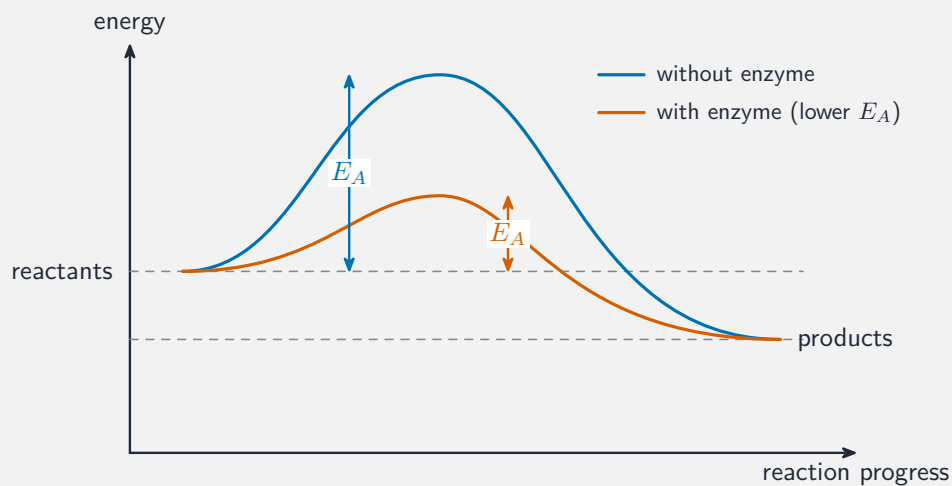
- Enzymes speed up the reactions in your body, like digesting food.
- They work best at a certain temperature (about body temperature) and pH.
- Too much heat "kills" an enzyme.

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.

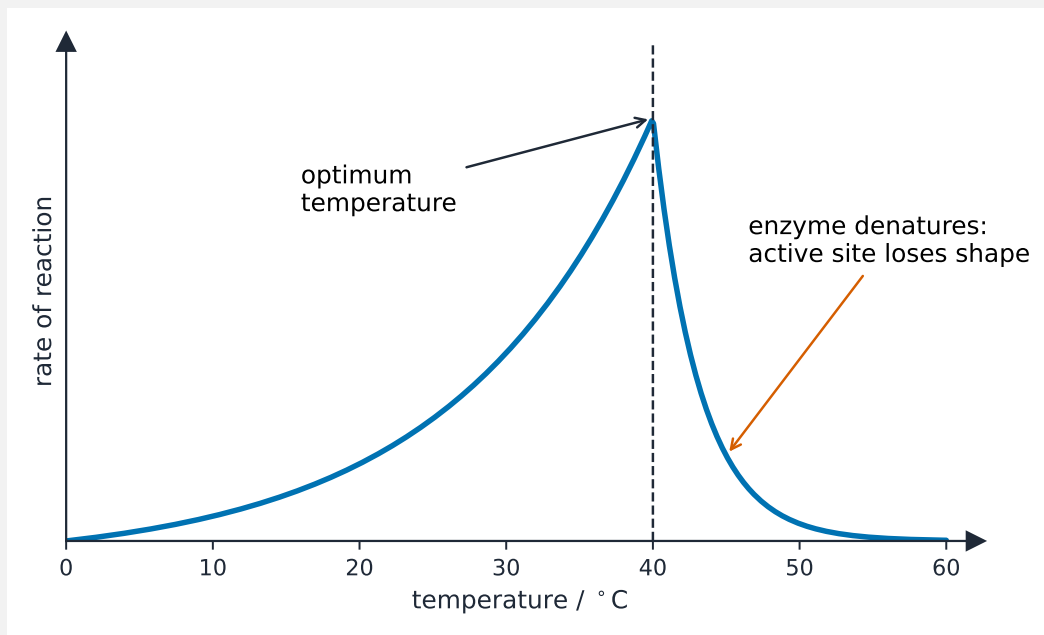


## ■ 2 The active site

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]

---