

8 Weak acids and buffers – Part 2

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)
weak acid	弱酸	_____
titration curve	滴定曲线	_____
equivalence point	等当点	_____
buffer	缓冲溶液	_____

Recall

In Part A you met acids, bases, and pH. Now the difference between strong and weak, and a special mixture that resists pH change:

- A strong acid splits fully into ions; a weak acid only partly.
- Blood and many chemicals keep a steady pH – thanks to buffers.

Each idea has a worked example before the Practice.

New ideas

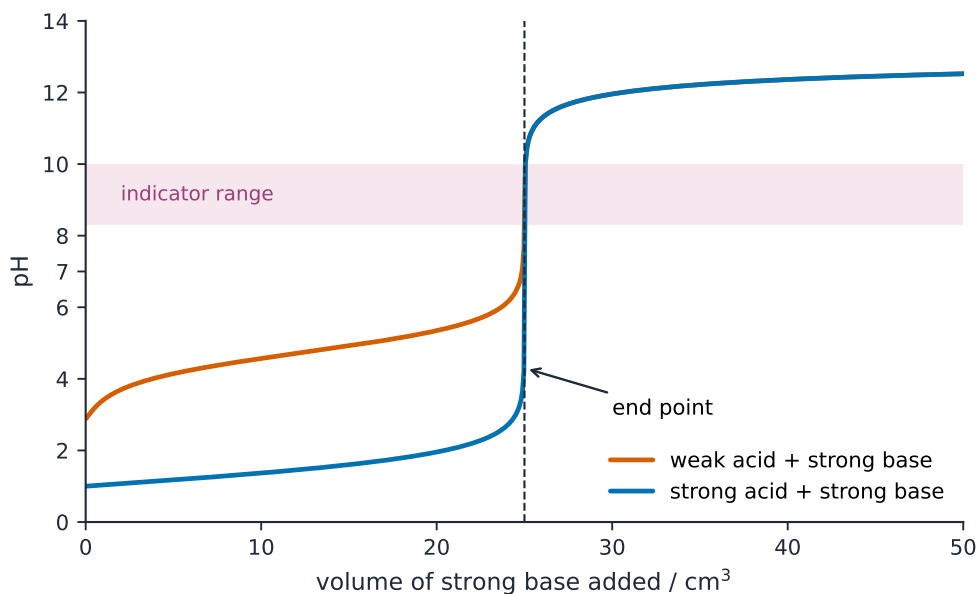
■ 1 Weak acids

A **weak acid** 弱酸 only **partly** dissociates in water – most of it stays as whole molecules. So at the same concentration a weak acid has a **lower** $[H^+]$, and a **higher** pH, than a strong one.

Worked example. 0.10 M HCl (strong) has pH 1.0, but 0.10 M acetic acid (weak) has pH about 2.9 – less acidic, because only a little of it dissociates.

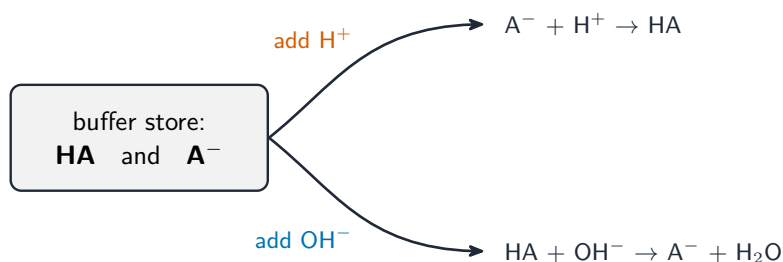
■ 2 Titration curves

A **titration curve** 滴定曲线 plots pH as base is added to acid. It rises gently, then jumps steeply at the **equivalence point** 等当点 (where the moles of acid and base are equal).



■ 3 Buffers

A **buffer** 缓冲溶液 resists changes in pH. It contains a weak acid **and** its conjugate base together.



either way, the pH barely changes

■ 4 How a buffer works

Add acid, and the conjugate base mops up the extra H⁺; add base, and the weak acid supplies H⁺ to replace what is removed. Either way, the pH barely moves.

Watch out: a buffer needs **both** a weak acid **and** its conjugate base present at once. A strong acid alone is not a buffer – it cannot soak up added acid.

Practice

Try these in order. The methods are all above.

2.1 State the difference between a strong acid and a weak acid. [2]

2.2 Explain why 0.10 M acetic acid has a higher pH than 0.10 M hydrochloric acid. [2]

2.3 On a titration curve, state what happens to the pH at the equivalence point. [1]

2.4 State the two things a buffer solution must contain. [2]

2.5 Explain how a buffer keeps the pH steady when a small amount of acid is added. [2]
