

7 Acids and bases – 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)		
acids	酸	_____	_____	_____
alkalis	碱	_____	_____	_____
protons	质子	_____	_____	_____
acid	酸	_____	_____	_____
proton donor	质子供体	_____	_____	_____
base	碱	_____	_____	_____
proton acceptor	质子受体	_____	_____	_____
alkali	碱	_____	_____	_____
dissociates	解离	_____	_____	_____
strong acid	强酸	_____	_____	_____
weak acid	弱酸	_____	_____	_____
Neutralisation	中和	_____	_____	_____
salt	盐	_____	_____	_____
titration curve	滴定曲线	_____	_____	_____
indicator	指示剂	_____	_____	_____

Recall

At IGCSE you met **acids** 酸 and **alkalis** 碱 and the **pH** scale. Now we define them by what they do with **protons** 质子 (H^+ ions).

- An acid gives away H^+ ; a base takes it.
- “Strong” and “weak” are about how fully an acid splits up.

New ideas

Read these first, then do the Practice.

■ 1 Brønsted–Lowry acids and bases

- an **acid** 酸 is a **proton donor** 质子供体 (gives H^+).
- a **base** 碱 is a **proton acceptor** 质子受体 (takes H^+). A soluble base is an **alkali** 碱.

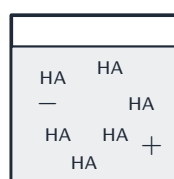
■ 2 Strong and weak

This is about how fully the acid **dissociates** 解离 (splits into ions) in water:

- a **strong acid** 强酸 is **fully** dissociated (almost all molecules split into ions).
- a **weak acid** 弱酸 is only **partly** dissociated (most stay whole).



strong (all ions)



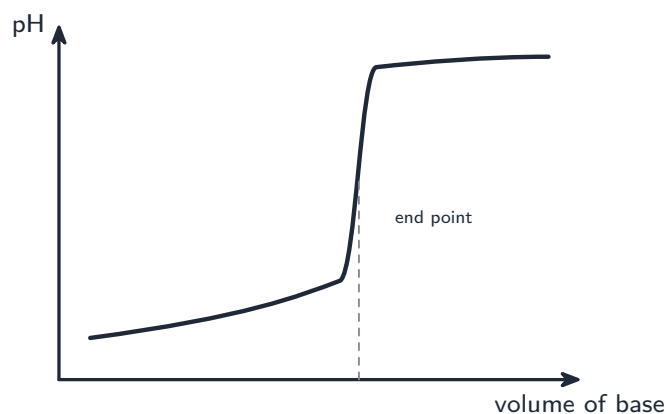
weak (mostly HA)

At the **same concentration**, a strong acid has a **lower pH** and conducts electricity better (more ions).

■ 3 Neutralisation and titration curves

Neutralisation 中和: $\text{H}^+(\text{aq}) + \text{OH}^-(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l})$, also forming a **salt** 盐.

A **titration curve** 滴定曲线 (pH against volume added) has a steep, almost vertical jump at the **end point**. Choose an **indicator** 指示剂 that changes colour inside that jump.



Watch out: *strong* (fully dissociated) is not the same as *concentrated* (a lot dissolved). A weak acid can be concentrated, and a strong acid can be dilute.

Practice

Try these in order.

7.1 Define an acid and a base in the Brønsted–Lowry theory. [2]

7.2 What is the difference between a *strong* and a *weak* acid? [2]

7.3 At the same concentration, which has the lower pH — a strong or a weak acid? [1]

7.4 Give two ways you could tell a strong acid from a weak acid in the lab. [2]

7.5 Write the ionic equation for neutralisation. [1]

7.6 Why does a strong acid conduct electricity better than a weak acid of the same concentration? [1]

7.7 Challenge. Equal concentrations of hydrochloric acid (strong) and ethanoic acid (weak) are compared. Explain why the hydrochloric acid has the lower pH. [2]
