

25 Strong and weak acids – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English	Write it 3 times (English)
strong acid	_____
weak acid	_____
acid dissociation constant	_____
ionic product of water	_____

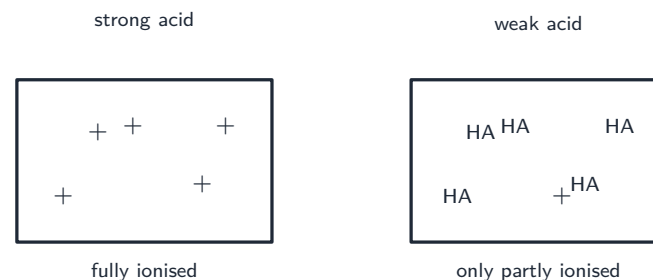
Recall

Acids differ in *strength* – how fully they ionise in water. This is measured by K_a .

New ideas

Read these first, then do the Practice.

■ 1 Strong vs weak



A **strong acid** is fully ionised in water; a **weak acid** is only partly ionised (most stays as molecules).

■ 2 The acid constant

$$K_a = \frac{[\text{H}^+][\text{A}^-]}{[\text{HA}]}$$

small K_a large K_a

weaker acid stronger acid

The **acid dissociation constant** K_a measures the strength. A larger K_a means a stronger acid. (The **ionic product of water** is $K_w = [\text{H}^+][\text{OH}^-] = 10^{-14}$.)

Worked example. A strong acid that gives one H^+ per molecule, at 0.10 mol dm^{-3} , is fully ionised, so $[\text{H}^+] = 0.10$ and $\text{pH} = -\log(0.10) = 1$.

Watch out: *strong* vs *weak* is about how *fully* an acid ionises (its K_a), not how *concentrated* it is. A larger K_a (smaller $\text{p}K_a$) means a stronger acid.

Practice

Try these in order.

25.6 What does *fully ionised* mean for a strong acid?

[1]

25.7 Is a *weak acid* fully or partly ionised? [1]

25.8 Does a *larger* K_a mean a stronger or weaker acid? [1]

25.9 Write the value of K_w at room temperature. [1]

25.10 For a strong acid of concentration 0.01 mol dm^{-3} , what is the pH? [1]

25.11 Challenge. Acid A has $K_a = 1 \times 10^{-3}$ and acid B has $K_a = 1 \times 10^{-5}$. State which is the stronger acid, and explain. [2]
