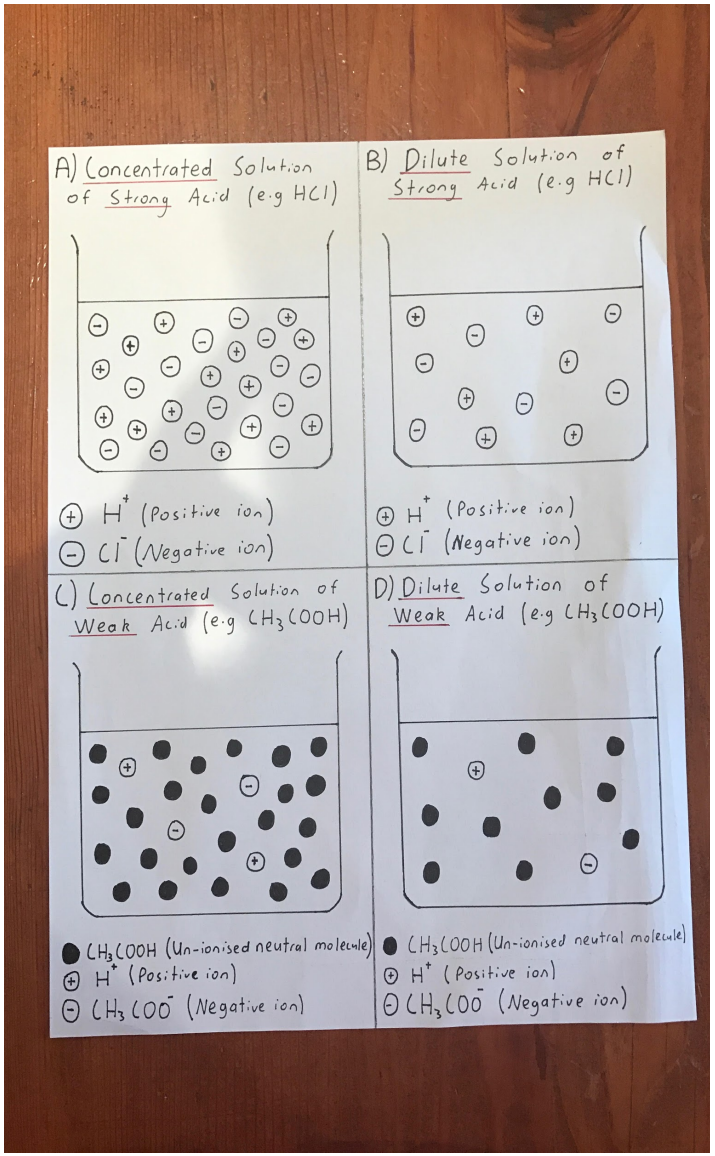
HSC Chemistry Module 6 Acid/Base Reactions

Using Bronsted-Lowry Theory:

Differences between strong, weak, concentrated and dilute acids



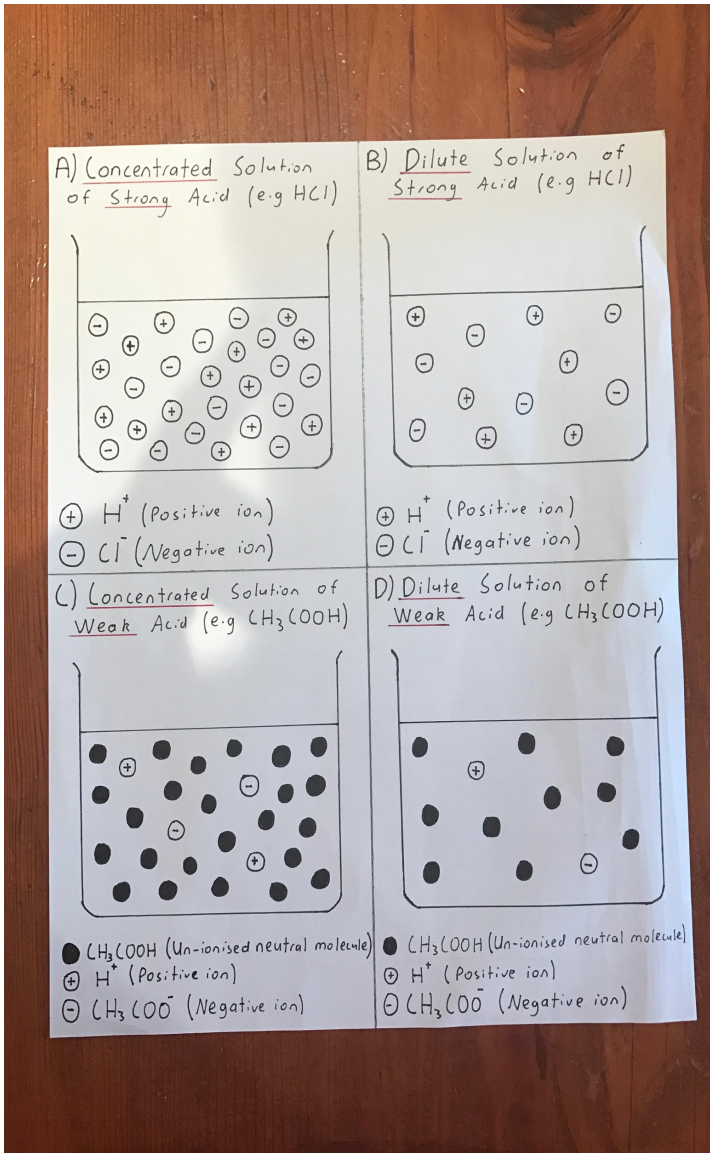
Strong

As shown in **figures A and B** a strong acid such as hydrochloric acid (HCL) is one that ionises completely, forming hydrogen ions and chloride ions, donating protons freely.

$HCl(aq) \rightarrow H^+(aq) + Cl^-(aq)$

OR

$HCl(aq) + H_2O(l) \rightarrow H_3O^+(aq) + Cl^-(aq)$

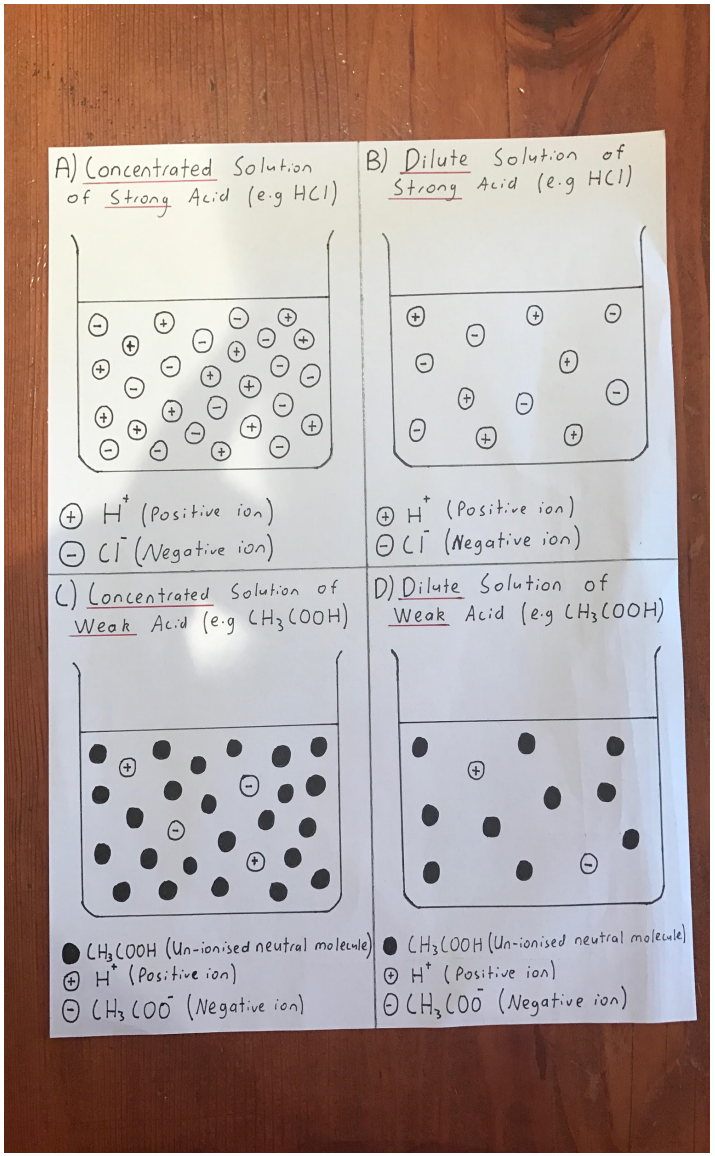


Weak

As shown in **figures C and D** a weak acid such as acetic acid (CH_3COOH) is one that only partially ionises, the rest remain as molecules, setting up an equilibrium between molecules and ions. It is not a good proton donor.

$CH_3COOH \rightleftharpoons H^+(aq) + CH3COO^-(aq)$

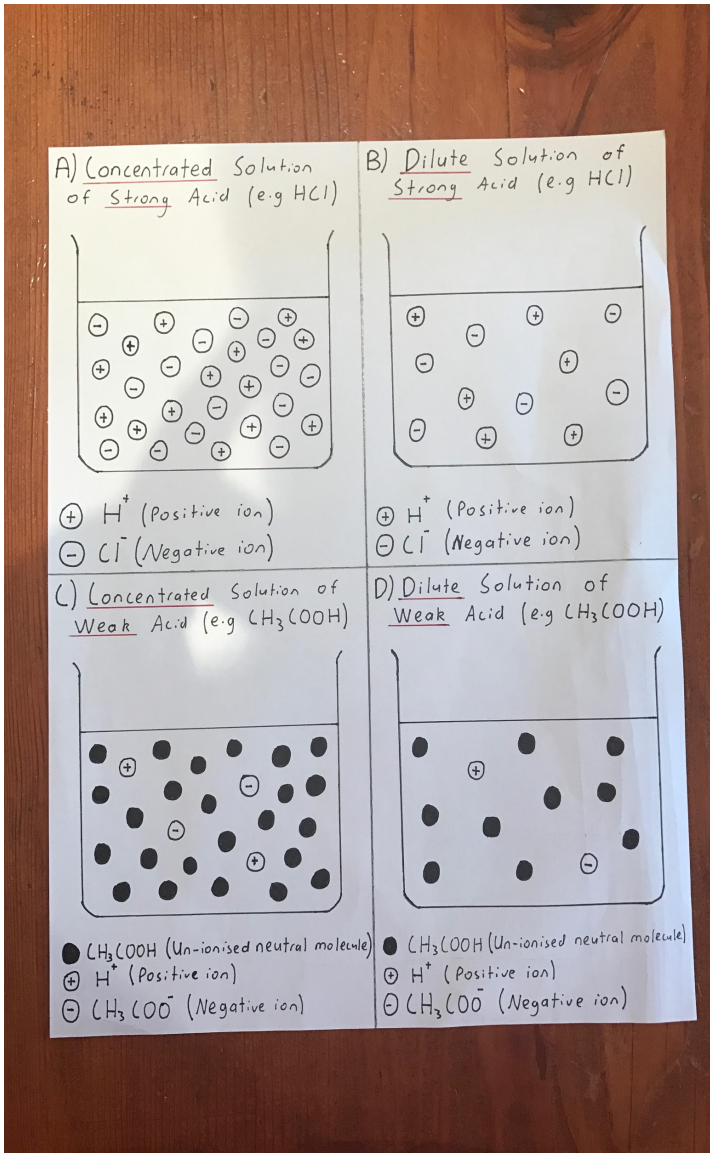
The forward reaction proceeds to a very small extent in water and very little of the acetic acid ionises to give $H^+(aq)$ and $CH3COO^-(aq)$. This can be seen by the few ions and more molecules present.



Concentrated

As shown in **figures A and C** a concentrated acid has a relatively large amount of solute dissolved in a given volume of solvent.

That is, contains a large number of moles of the substance per litre.



Dilute

As shown in **figures B and D** a dilute acid has a relatively small amount of solute dissolved in a given volume of solvent.

That is, it contains a small number of moles of the substance per litre.

This is represented in the diagrams with the concentrated acids having more ions/molecules compared to the dilute acids, which have far fewer.