Acids and Bases

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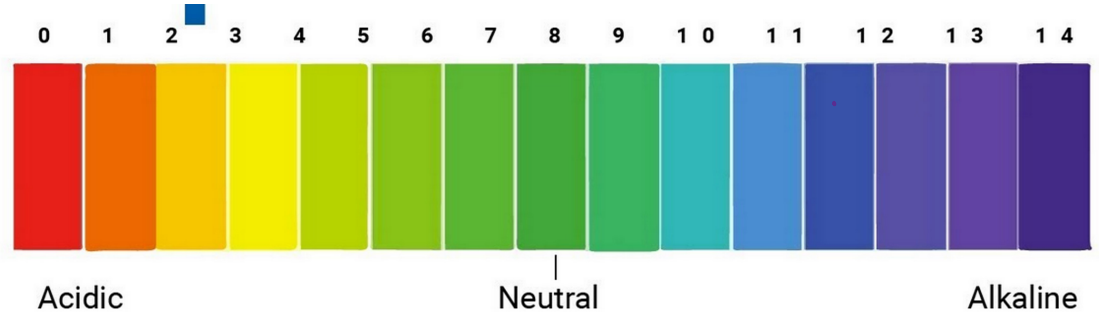

An acid forms aqueous solutions with H^+ ions in water
A base has pH > 7. An alkali is a base that dissolves in water leading to OH^- ions

Acids and bases neutralise each other forming water and a salt (so there are lots of different salts of which sodium chloride is one)

Acid + base → salt + water

or you can think of the ions:

$H^+_{(aq)} + OH^-_{(aq)} \rightarrow H_2O_{(l)}$

Strong and Weak Acids

Acids turn to ions in water - ie H^+ ions are produced

$HCl \rightarrow H^+ + Cl^-$

$HNO_3 \rightarrow H^+ + NO_3^-$

Strong acids ionise completely to from H^+. We say every acid particle has dissociated. Weak acids do not completely ionise.

Weak acids ionise - but the reaction is reversible, which ends up in an equilibrium between the undissociated and dissociated acid.

As you might expect the reactions with strong acids go quicker - because there is a higher concentration of H^+

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

$CH_3COOH \rightleftharpoons H^+ + CH_3COO^-$ (weak)

So... What is pH?

pH is a measure of the concentration o f the H^+ ions
For every step along the pH scale from acid toward alkali, is a decrease in the concentration of a factor of 10. This means that if you have a weak and a strong acid of the same concentration the strong will have more a higher pH.

- Strength tells us what proportion of the acid molecules have ionised in water.
- Concentration tells us how much acid there is in a certain amount of water