

Strength of Acids and Alkali

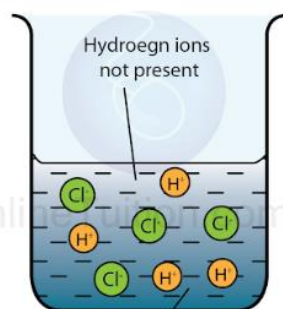


Strong Acids and Weak Acids

- Acids are chemical substances that ionize/dissociate in the presence of water to produce hydrogen ions (or hydroxonium ions).
- Acids can be classified into 2 categories :-
 - Strong acids
 - Weak acids
- The strength of an acid depends on the degree of ionization/dissociation of the acid.

Strong Acids

A strong acid is a chemical substance that ionise completely to form hydrogen ions in water
Degree of ionisation: 100%



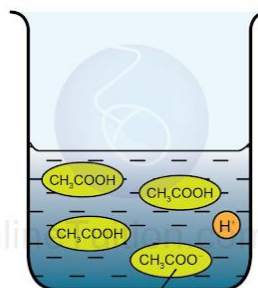
Concentration of H^+ ↑, pH ↓



- Strong acids are acids that ionise completely to form hydrogen ions in water.
- Examples :-
 - Sulphuric acid
 - Hydrochloric acid
 - Nitric acid

Weak Acids

A weak acid is a chemical substance that ionise completely to form hydrogen ions in water
Degree of ionisation < 100%



Concentration of H^+ ↓, pH ↑

- Weak acids are acids that partly ionise to form hydrogen ions in water.
- Examples :-
 - Ethanoic acid
 - Phosphoric acid
 - Citric acid

Strength of Alkali

- Similar to strength of acids, the strength of an alkali is defined by its ability to ionise and release hydroxide ions (OH^-) in the solution.
- In a solution of strong alkali, all the alkali molecules are ionised in the water to produce hydroxide ions.
- In a solution of weak alkali, only small portion of the molecules are ionised to release hydroxide ions.



pH scale



- pH scale is a measure of acidity and alkalinity.
- Practically, it is numbered between 0 and 14.
- Neutral substance has pH of 7.
- A solution of pH less than 7 is acidic
- The lower the pH, the more acidic the solution or the higher the concentration of H^+ ions in the solution.
- A solution of pH above 7 is alkaline.
- The higher the pH, the more alkaline the solution or higher concentration of OH^- ions presence in the solution.
- The pH of a solution can be measured by using the Universal indicator, pH paper or with a pH-meter.

Acids / Alkali indicator

- An indicator is a substance or mixture of substances that when added to the solution gives different colours depending on the pH of the solution.



Indicator	colour in acid pH<7	colour in neutral pH=7	colour in alkali pH >7
litmus	red	'purple'	blue
phenolphthalein	colourless	colourless	pink
methyl orange	pinky red	orange about pH 6	yellow
methyl red	red	orange	yellow
bromothymol blue	yellow	green	blue

- The best indicator of all is the universal indicator.
- It can be used to show not only whether a substance is acidic or alkaline, but also whether it is a strong acid or a weak acid.

