

Acids, alkalis and salts

Neutralisation

Remember:

- **acids** are substances that form **hydrogen ions**, H^+ (aq), when added to water
- acids have a pH less than 7, and turn universal indicator red (if strong) or yellow (if weak)
- **bases** are metal oxides and metal hydroxides
- if a base can dissolve in water, it is also an **alkali**
- **alkalis** are substances that form **hydroxide ions**, OH^- (aq), when added to water
- alkalis have a pH more than 7, and turn universal indicator dark blue (if strong) or blue (if weak)

When an acid is added to an alkali, they react together. This reaction is called neutralisation. In neutralisation, the H^+ ions from the acid react with the OH^- ions from the alkali to produce water. The equation for this reaction is: H^+ (aq) + OH^- (aq) \rightarrow H_2O (l) Try to learn it!

Salts

When acids react with metals, bases, metal carbonates, metal hydrogencarbonates or ammonia, **salts** are formed. You need to be able to work out the name of the salt formed in reactions involving hydrochloric acid and sulphuric acid. These are the rules:

The names of salts have two parts.

1. The first part is the name of the **metal** involved in the reaction. This can come from the metal itself, or its compound. For example, the metal in the alkali called sodium hydroxide is **sodium**. There is only one exception – if **ammonia** is used to react with the acid, the first part of the name is **ammonium**.
2. The second part comes from the acid used: it is **chloride** if hydrochloric acid is used, **sulphate** if sulphuric acid is used, and **nitrate** if nitric acid is used.

For example, hydrochloric acid reacts with sodium hydroxide to make a salt called **sodium chloride**.

Tasks and questions

1. What are the differences between acids and alkalis?
2. What is neutralisation?
3. Use the rules for naming salts to work out the **names** of the salts formed in the following reactions. Write down the names of the chemicals reacting, and the name of the salt formed.
 - a) hydrochloric acid + sodium
 - b) hydrochloric acid + copper oxide
 - c) hydrochloric acid + potassium hydroxide
 - d) hydrochloric acid + calcium carbonate
 - e) hydrochloric acid + sodium hydrogencarbonate
 - f) hydrochloric acid + ammonia
 - g) Reactions a) to f), but using sulphuric acid, and then nitric acid, instead of hydrochloric acid.