

Reactions

2. Acids and alkalis

CONCEPT 3

NEUTRALISATION

NOTES

When we add an alkali to an acid there is a chemical reaction. New products (substances) are made. The substance that is made is no longer acidic, or alkali. The pH of the products become more neutral – pH7. When we add more alkali to the acid, the pH increases, until it becomes neutral. If too much alkali is added, it becomes a weak alkali. The secret is to add just the right amount of alkali to the acid to make it neutral.

A Bee sting is acidic (but a weak acid). Baking soda is a weak alkali. If we get stung by a bee, we can use baking soda to make the acidic bee sting change its pH closer to 7. This is an example of a neutralisation reaction.

An example of a neutralisation reaction that uses everyday acids and alkalis is when we add bicarbonate of soda to vinegar. Some people do this to make organically made cleaning products.

We can also add lab acids to lab alkalis to make a neutralisation reaction. An example of this is when we add hydrochloric acid to sodium hydroxide. If the right amounts of acids and alkalis are added together, we form a neutral product. The substances (products) formed are a salt and water.

I We can write word equations for neutralisation. There is a rule that always works in these reactions:

Acid + alkali → salt + water

When we use lab acids and alkalis, we can easily predict the name of the salt that is made, by looking at the reactants (or things reacting):

Hydrochloric acid + sodium hydroxide → sodium chloride + water

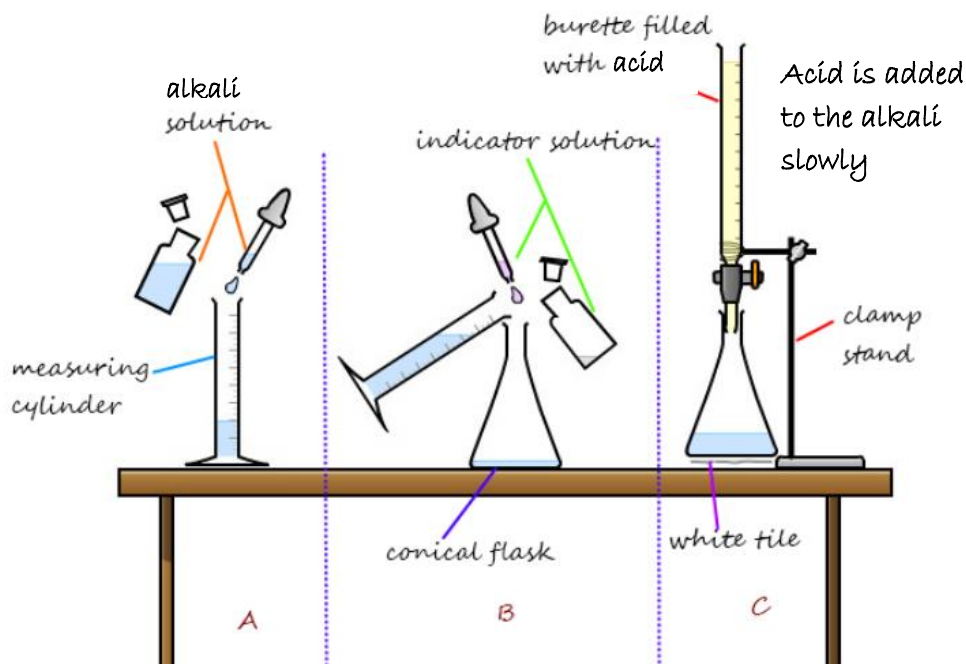
Some other examples of reactions include:

Nitric acid + potassium hydroxide → potassium nitrate + water

Sulphuric acid + calcium hydroxide → calcium sulfate + water

The way in which we make sure that we add the correct amount of alkali into the acid (or vice versa), we do a titration experiment. Titration can be used to carry out a neutralisation reaction precisely.

1. First we measure the amount of alkali into the measuring cylinder (right). If we want it to be more precise, we use a pipette (see below right).



2. Then we place the alkali into the conical flask, with an indicator.
3. Then we fill the burette with acid, and add it to the alkali (in the conical flask) bit by bit, until we get a neutral solution in the conical flask.
4. The indicator will give a specific colour when it is neutral. Each different indicator will give a different colour when the solution is neutral.

We use a burette, which is long and thin, as it is more precise to get the exact amount of liquid to be added.

