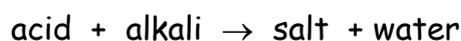


## Chemical Reactions - Summary Notes

- I can tell that a chemical reaction takes place if I observe one or more of the following.
  - a change of colour taking place
  - heat is given out or taken in
  - a gas is given off
  - a solid forms when two solutions mix
- Many chemical reactions give out energy. They are called exothermic reactions.
- Some reactions take in energy from the surroundings. These are called endothermic reactions.
- It is not easy to reverse a chemical change. For example burning magnesium produces magnesium oxide which cannot be easily changed back into magnesium and oxygen.
- A physical change can be reversed. For example water can be frozen to make ice and then melted to produce water again.
- Acids and alkalis are chemical opposites.
- Indicators can be used to show which things are acids and which are alkalis. Examples are Litmus and Phenolphthalein which change to a certain colour depending on whether an acid or an alkali are mixed with them
- Read over lesson 6 to make sure you can explain how to make an indicator.
- All the indicators used before have their uses but chemists had to develop an indicator which was able to distinguish more carefully between acids and alkalis. The indicator made was Universal Indicator. It is a very dark green colour to start with.
- The pH scale tells us **how** acidic or **how** alkaline something is.

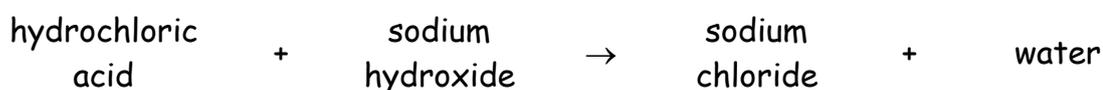
Red		orange		yellow		green		blue		purple			
1	2	3	4	5	6	7	8	9	10	11	12	13	14
very acidic		slightly acidic		neutral		slightly alkaline		very alkaline					

- pH numbers less than 7 represent ACIDS. pH numbers greater than 7 represent ALKALIS
- pH 7 is NEUTRAL
- Make sure you can describe how to make a salt using neutralisation.
- When an acid reacts with an alkali and a neutral solution is produced we say that neutralisation has taken place. A chemical reaction has occurred which has produced two new chemicals. One of these is water. The other is a salt.



When hydrochloric acid is used in a neutralisation experiment the salt formed is a chloride. In this reaction the salt made is called sodium chloride. It is common salt used as seasoning on food.

- In this experiment the word equation is



- Different acids and alkalis form different salts.
- Alkalis can be used to neutralise stomach acids.  
Sugar will not neutralise acid.
- Be able to carry out and explain tests to neutralise stomach powders.  
This comes from lesson 10 and you should include:
  - (a) how you carried out the tests.
  - (b) the quantities you used in each test
  - (c) the results
  - (d) which powder is best at neutralising stomach acid.
- Some salts can be used as fertilisers.

- The three main elements in fertilisers are Nitrogen (N), Phosphorus (P) and Potassium (K).

To make fertiliser you could do the following:

1. Put 10 cm<sup>3</sup> of sulphuric acid into the beaker.
2. Add 5 drops of universal indicator to the beaker
3. Add some ammonium hydroxide to the second beaker
4. Using the syringe add ammonium hydroxide 1 cm<sup>3</sup> at time to the sulphuric acid in the beaker. Count the number you are adding. Stop when the solution just becomes pale green.

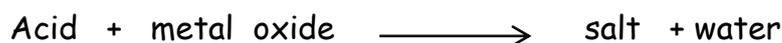
Repeat the experiment but this time DO NOT ADD ANY UNIVERSAL INDICATOR. You will have a colourless solution. Neutralisation has taken place and you have a solution of ammonium sulphate.

5. Pour the solution into an evaporating basin. Place the evaporating basin on top of a beaker which is half full of water and evaporate off the water until the solution has reduced by half. Leave the evaporating basin to cool.
6. Collect the apparatus you need to filter the solution.
7. Filter the crystals from any solution left.
8. Dry them with a paper towel. You now have the fertiliser ammonium sulphate.

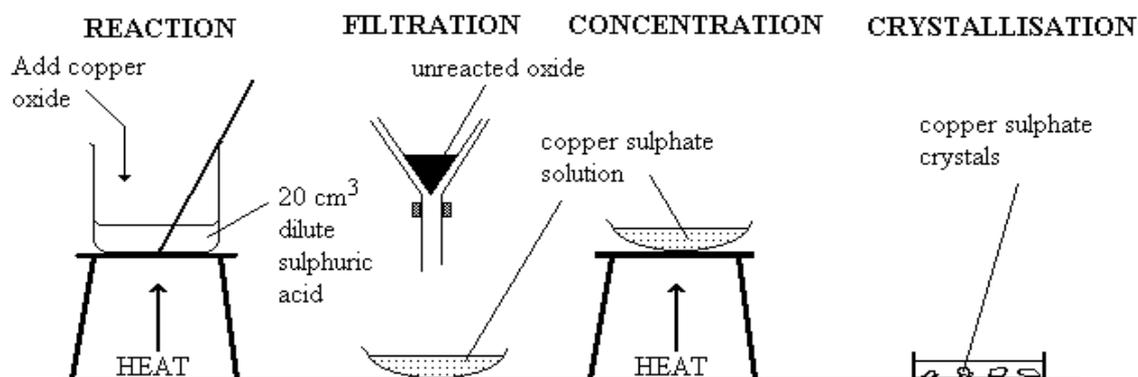
- When a METAL reacts with an ACID, a gas is formed. The gas is HYDROGEN.



- Reacting Acid With Metal Oxides



- Sulphuric acid makes salts called sulphates.



- When marble chips (calcium carbonate) are added to hydrochloric acid a gas is produced which is passed through an indicator and also lime water.
- When bubbled through universal indicator the liquid turned orange/red showing the gas was acidic
- When bubbled through limewater solution, the liquid turned cloudy showing the gas is carbon dioxide.

