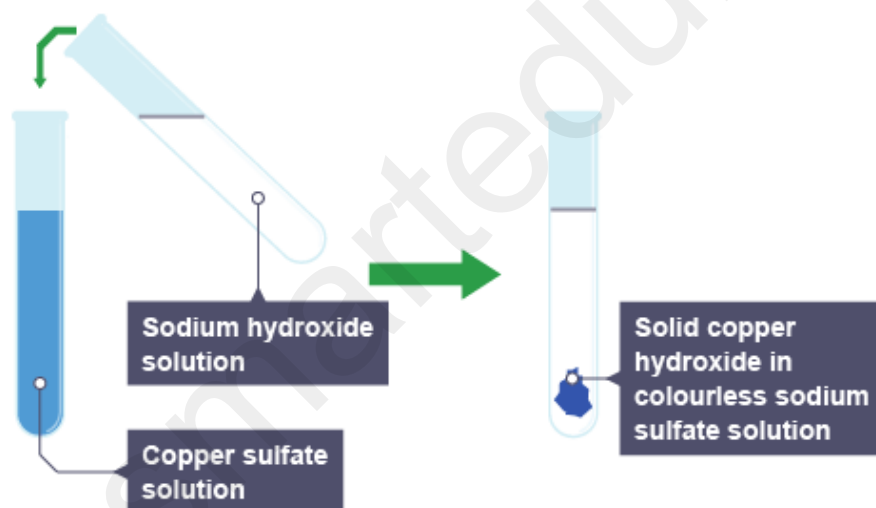


13. Ionic equations:

Precipitates

- Ionic substances contain *charged particles* which are called ions. These are in fixed positions in solids, but they are free to move when they are *molten* or in solution. Most precipitation reactions involve ions from one solution reacting with ions from another solution.
- In a precipitation reaction, ions collide with one another to form an insoluble product (one that does not dissolve in water). This is the precipitate.
- Most precipitation reactions are very fast because there is a high chance of collisions between ions in solution. The precipitate forms as soon as two suitable solutions are mixed together

For example, copper sulfate solution is clear and blue, while sodium hydroxide solution is clear and colourless. A blue precipitate of copper hydroxide immediately forms when they are mixed.



The reaction can be shown as a word equation or as a balanced symbol equation as follows:

copper sulfate + sodium hydroxide → sodium sulfate + copper hydroxide



You can tell that the copper hydroxide forms a solid (the precipitate) because its state symbol is (s) for solid, rather than (aq) for aqueous (dissolved in water).

The reaction can also be shown by an ionic equation:



This only shows the reaction between the ions that produce the precipitate.
Steps to change the symbol equation into an ionic equation:



Step 1: Break all the ionic compounds with the state symbol (aq) in their ions keeping the others unchanged. Do not forget to balance the ions in step 1



Step 2: Cancel out the spectator ions



Write the final equation which is left. This is the required ionic equation.



Example 1:

[O/N/03/Q3C]

Q3C (ii) Write an ionic equation for the reaction between zinc atoms and silver(I) ions.

.....[2]

Example 2:

[M/J/01-P3/Q3b]

(b) The equation for the reaction in experiment 1 is:



Complete the following ionic equation.



[1]