

Reactions

1. Metals and non-metals

CONCEPT 4

DISPLACEMENT REACTIONS

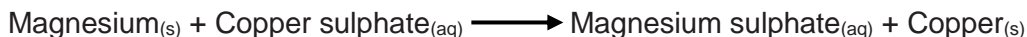
NOTES

The reactivity series allows us to predict how a metal will react. A more reactive metal will displace a less reactive metal from a compound.

Displacement reactions occur when a more reactive metal is placed in the solution of a less reactive metal salt solution. The difference in reactivity of the two metals will determine how quickly the reaction happens but the general observations for one of these reactions would be:

The more reactive metal gradually disappears as it forms a solution and the less reactive metal coats the surface of the more reactive metal.

For example, when magnesium is placed into a solution of copper sulphate (salt.) the observer would start to see a colour change. Copper sulphate has a blue colour; this colour begins to fade as it is replaced by magnesium sulphate which is colourless. As this progresses the observer will start to see a brown solid depositing onto the surface of the magnesium, this is solid copper forming because the magnesium has taken the sulphate from it. The word equation for this reaction would look like this:



The letters in brackets in the equation are called state symbols, these symbols tell us what state the substance is in before and after the reaction.

(s) = Solid

(l) = Liquid

(g) = Gas

(aq) = aqueous solution (dissolved in water)

All displacement reactions can be predicted by looking at the reactivity series and comparing the reactivity of the metals involved in the reactions.

Most Reactive	
POTASSIUM	¹⁹ K
SODIUM	¹¹ Na
CALCIUM	²⁰ Ca
MAGNESIUM	¹² Mg
ALUMINUM	¹³ Al
CARBON	⁶ C
ZINC	³⁰ Zn
IRON	²⁶ Fe
TIN	⁵⁰ Sn
LEAD	⁸² Pb
HYDROGEN	¹ H
COPPER	²⁹ Cu
SILVER	⁴⁷ Ag
GOLD	⁷⁹ Au
PLATINUM	⁷⁸ Pt
Least Reactive	