Oxidation and Reduction

Chemistry – Leaving Cert

Quick Notes

Oxidation and Reduction

Oxidation is the addition of oxygen, removal of hydrogen, loss of electrons and increase in oxidation number. Reduction is the removal of oxygen, addition of oxygen, gain of electrons and decrease in oxidation number. Oxidation number is the charge that an atom has or appears to have when electrons are distributed according to certain rules e.g. the oxidation number of any uncombined element is zero, oxygen usually has an oxidation number of -2. Reduction-oxidation reactions are known as redox reactions. An oxidising agent causes a substance to be oxidised, that is to lose electrons, it itself gains these electrons and so becomes reduced e.g. hydrogen peroxide, iodine solution. A reducing agent causes a substance to be reduced, that is to gain electrons, it itself loses these electrons and so becomes oxidised e.g. carbon monoxide, sulfur dioxide. When balancing a redox equation, the number of electrons lost be one atom must be the same as the number of electrons gained by another electron. In studying some redox equations it can be seen that the halogens can oxidise sulfite ions to sulfate ions and they can oxidise Fe^{2+} to Fe^{3+}. Similarly, Cl_2 can oxidise both Br^- and I^- ions and Br_2 can oxidise I^- ions. Lastly, both magnesium and zinc metals can displace copper metal from solution.