

## Unit 6 REDOX (Paper 1 & 3)

### 6.1 Oxidation, reduction and redox equations

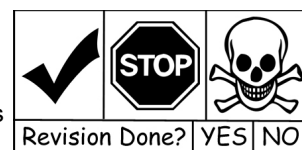
Oxidation is the process of electron loss and oxidising agents are electron acceptors.

Reduction is the process of electron gain and reducing agents are electron donors.

The rules for assigning oxidation states.

**You should be able to:**

- work out the oxidation state of an element in a compound or ion from the formula
- write half-equations identifying the oxidation and reduction processes in redox reactions
- combine half-equations to give an overall redox equation.



## Unit 7 Group II & Group VII (Paper 1 & 3)

### 7.1 Group 2, the alkaline earth metals

The trends in atomic radius, first ionisation energy and melting point of the elements Mg–Ba

**You should be able to:**

- explain the trends in atomic radius and first ionisation energy
- explain the melting point of the elements in terms of their structure and bonding. The reactions of the elements Mg–Ba with water.

The use of magnesium in the extraction of titanium from  $\text{TiCl}_4$

The relative solubilities of the hydroxides of the elements Mg–Ba in water.

$\text{Mg}(\text{OH})_2$  is sparingly soluble.

The use of  $\text{Mg}(\text{OH})_2$  in medicine and of  $\text{Ca}(\text{OH})_2$  in agriculture.

The use of  $\text{CaO}$  or  $\text{CaCO}_3$  to remove  $\text{SO}_2$  from flue gases.

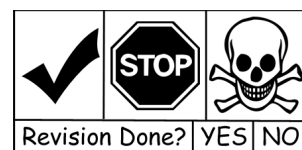
The relative solubilities of the sulfates of the elements Mg–Ba in water.

$\text{BaSO}_4$  is insoluble.

The use of acidified  $\text{BaCl}_2$  solution to test for sulfate ions.

The use of  $\text{BaSO}_4$  in medicine.

**You should be able to** explain why  $\text{BaCl}_2$  solution is used to test for sulfate ions and why it is acidified.



### 7.2 Group 7(17), the halogens

#### *Trends in properties*

The trends in electronegativity and boiling point of the halogens.

**You should be able to:**

- explain the trend in electronegativity
- explain the trend in the boiling point of the elements in terms of their structure and bonding.

The trend in oxidising ability of the halogens down the group, including displacement reactions of halide ions in aqueous solution.

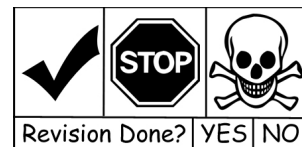
The trend in reducing ability of the halide ions, including the reactions of solid sodium halides with concentrated sulfuric acid.

The use of acidified silver nitrate solution to identify and distinguish between halide ions.

The trend in solubility of the silver halides in ammonia.

**You should be able to** explain why:

- silver nitrate solution is used to identify halide ions
- the silver nitrate solution is acidified
- ammonia solution is added.



#### *Uses of chlorine and chlorate(I)*

The reaction of chlorine with water to form chloride ions and chlorate(I) ions.

The reaction of chlorine with water to form chloride ions and oxygen.

Appreciate that society assesses the advantages and disadvantages when deciding if chemicals should be added to water supplies.

The use of chlorine in water treatment.

Appreciate that the benefits to health of water treatment by chlorine outweigh its toxic effects.

The reaction of chlorine with cold, dilute, aqueous  $\text{NaOH}$  and uses of the solution formed.

