

17 Assumed Knowledge

During Year 11 you studied **electrolysis, ionisation reactions and the activity series**. You will need to know the work in these topics to understand this section. Answer these revision questions and see your teacher if you have difficulties with any of them.

For You To Do

- Identify the instrument used to measure potential difference.
- What do we call the plates, often made of metal, that carry electricity into or out of a solution?
- When a solution conducts electricity, what carries the charge?
- Outline the meaning of the term 'electrolysis'.
- Identify the energy change that takes place during electrolysis.
- What do we call a substance that conducts electricity when molten or in solution?
- Identify three examples of electrolytes.
- Two gases are produced by the electrolysis of water. Name them.
- Which of these two gases is produced at the positive electrode?
- Identify the gas that will:
 - 'pop' when ignited
 - re-ignite a glowing splint
 - bleach litmus paper
 - turn limewater milky.
- Identify the apparatus used to carry out the electrolysis of water.
- Identify a metal that is extracted from its ore by electrolysis.
- Does electrolysis cause a physical or a chemical change?
- State four observations that allow us to identify a chemical change.
- Define decomposition.
- When a metal forms ions, it (loses/gains) one or more electrons.
- When a non-metal forms ions it (loses/gains) one or more electrons.
- Define:
 - ionisation
 - ionisation energy.
- Identify a metal that is purified by using electrolysis.
- Write equations to show:
 - the ionisation of an atom of magnesium
 - the ionisation of an atom of chlorine.

- Based on the reactions of metals with acids that you carried out during the Preliminary course, list the following metals in order of activity:
lead, iron, sodium, aluminium, magnesium, copper
- Match Columns A and B in the table below.

Column A	Column B
Loses electron(s) to form an ion	Compound
Gains electron(s) to form an ion	Metal
Negatively charged ion	Cation
Positively charged ion	Non-metal
Can be decomposed by electric current	Anion

- Complete the following table to show what happens during ionisation. The first column is done for you.

Atomic symbol	Loses or gains electron(s)	No. of electrons lost or gained	Symbol for ion
Ca	Loses	2	Ca^{2+}
S			S^{2-}
Al			Al^{3+}
Na			Na^+
Cl			Cl^-
O			O^{2-}

- Samples of magnesium and copper were tested with water and then with dilute hydrochloric acid and their reactions noted. Another unknown metal (X) was also tested in this way. Use the results shown below to rank the three metals in order of activity.

Metal	Reaction with water	Reaction with dilute HCl
Magnesium	Reacts with hot water, bubbles form	Vigorous reaction, lots of bubbles
Copper	No reaction	No reaction
X	No reaction	Slow reaction

- Define and give an example of a polyatomic ion.
- Write equations for the following reactions:
 - magnesium and dilute hydrochloric acid
 - calcium and dilute sulfuric acid.
 - Express the reactions in part (a) as full ionic equations and then as a net ionic equations.
 - Write each of the net ionic equations as two half equations.