

- 1 Sketch a labelled diagram of an electrolytic cell for electrolysis of molten sodium bromide.
- 2 Explain why a salt must be molten for electrolysis to occur
- 3 Explain how current is conducted in an electrolytic cell.

- 4 For electrolysis of each of the molten salts in the table:

Molten sodium chloride	Molten aluminium oxide
Molten zinc bromide	Molten magnesium chloride

- state the products at the anode and the cathode
 - write half-equations for the reactions at the electrodes
- 4 Explain at which electrodes oxidation and reduction occur in an electrolytic cell
 - 5 State two differences between an electrolytic cell and a voltaic cell
 - 6 For electrolysis, using platinum electrodes, of each of the aqueous solutions in the table:

Concentrated NaCl(aq)	CuSO ₄ (aq)
H ₂ SO ₄ (aq) (acidified water)	MgBr ₂ (aq)

 - state the products at the anode and the cathode
 - write half-equations for the reactions at the electrodes
 - 7 Explain why hydrogen is produced at the cathode when aqueous sodium chloride is electrolysed but copper is produced at the cathode when aqueous copper(II) sulfate is electrolysed
 - 8 Explain how concentration of a sodium chloride solution can affect the products of electrolysis
 - 9 Explain two observations when copper(II) sulfate solution is electrolysed with platinum electrodes
 - 10 Explain two observations when copper sulphate solution is electrolysed with copper electrodes
 - 11 State the meaning of the term *electroplating*
 - 12 Draw a labelled diagram of the experimental set-up to silver plate a metal spoon
 - 13 List the factors which affect the amount of product formed during electrolysis.
 - 14 Calculate the relative amounts of products formed during electrolysis
 - (a) Copper(II) sulfate solution is electrolysed using platinum electrodes. 0.636 g of copper is produced, calculate the volume of oxygen (measured at STP) collected.
 - (b) Dilute sulfuric acid is electrolysed using platinum electrodes. 100.0 cm³ of hydrogen (measured at STP) is produced, calculate the volume of oxygen (measured at STP) collected.
 - (c) A current of x amps is passed for y minutes through a solution containing Cu²⁺(aq) ions and z g of copper were produced. What mass of copper is produced when 2x amps are passed for y/2 minutes?
 - (d) Two electrolytic cells are connected together in series. The first contains aqueous copper(II) sulfate and the second contains aqueous lead(II) nitrate. All the electrodes are made of platinum. If 0.16 g of copper are produced in the first cell calculate the mass of lead produced in the second cell.
 - (e) How will doubling the current that passes and electrolysing the solutions for 3 times as long affect the mass of copper produced in (d)