Electrolysis and its products

AQA 8462 Separate Chemistry · Foundation and Higher

Answer on your own paper. Show your working where needed.

1. The solid and the melt

Explain why molten magnesium chloride acts as an electrolyte but solid magnesium chloride does not.

2. Which electrode?

An electrolyte contains Na^+ and Cl^- ions. Give the name and charge of the electrode each type of ion moves towards.

3. A molten salt

Molten zinc bromide contains Zn^{2+} and Br^- ions. Predict the substance that forms at each electrode during electrolysis with inert electrodes.

4. The effect of water

A sodium sulfate solution is electrolysed with inert electrodes. Name the gases at the cathode and anode. Explain why sodium is not formed.

5. Electrolysis of copper(II) sulfate

Copper(II) sulfate solution is electrolysed with graphite electrodes. Predict which electrode gets a coating and identify the coating. Explain how the blue colour of the solution changes.

6. Making aluminium

Aluminium oxide is dissolved in molten cryolite before it is electrolysed. Explain why the mixture is used. Explain why the carbon positive electrodes gradually need replacing.

7. Aluminium from its ions (Higher)

Write the half equation for Al^{3+} ions forming aluminium at the cathode. Explain whether it shows oxidation or reduction.

8. Reactions at inert electrodes (Higher)

Copper(II) sulfate solution is electrolysed with inert electrodes. Predict the products and write a balanced half equation for each electrode. The ions discharged are Cu^{2+} and OH^-.

9. Extra challenge · One salt, two methods

A student expects potassium metal at the negative electrode from both molten potassium bromide and aqueous potassium bromide. Use the ions present and the reactivity series to explain where the prediction succeeds and where it fails. State what you expect at the positive electrode in both cases.

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