Electrolysis and its products

Pearson Edexcel 1CH0 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. Compare copper electrodes

Copper(II) sulfate solution is electrolysed using two copper electrodes. Assume only copper is transferred. Predict what happens to the mass of each electrode and to the intensity of the blue colour. Explain your predictions.

7. Recover pure copper (Higher)

An electrolytic cell contains copper sulfate solution and two copper electrodes. The positive electrode is made from impure copper. Assume only copper is transferred. Write the half equations at each electrode. Explain why solid copper can be collected from the negative electrode.

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 · Read the electrode results

Copper sulfate solution is electrolysed twice, once with inert carbon rods and once with copper electrodes. Run X gives a metal coating on one electrode, bubbles on the other and a paler solution. Run Y gives equal metal mass gains and losses with no lasting change in the blue colour. Identify each electrode type and explain the observations.

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