**Electrolysis Experiment**

**(This sheet accompanies the video experiment)**

**Aim:** To investigate the relationship between mass and current in an electrolytic cell.

**Background**

If you run a current through a CuSO4 solution and use copper electrodes, the mass of the electrodes will change. In this experiment we will:

* investigate the reaction occurring
* investigate the mass changes at the electrodes.

**Part A**: Reaction occurring

The possible reactants are Cu, Cu2+ and water.

Use the electrochemical series to list the relevant half-equations.

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q1 Write the overall equation for the reaction occurring.

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Q2 What will you observe at the

Anode: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Cathode: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Mass readings** Current 2.4 amps, time 2 minutes

|  |  |  |
| --- | --- | --- |
| Electrode | Initial mass g | Final mass g |
| A | 25.60 | 25.51 |
| B | 28.20 | 28.27 |

Q3 Which electrode is the anode? Justify your answer.

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Q4 Use the current and time values to predict the mass change that should occur?

Q5 Does the anode or cathode seem to give better results and suggest reason(s) why?

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**Part B**: Mass and time

Current 3.6 amps

|  |  |  |
| --- | --- | --- |
| Time (mins) | Initial mass g | Final mass g |
| 2 | 26.40 | 26.26 |
| 4 | 26.26 | 25.97 |
| 6 | 25.97 | 25.57 |
| 8 | 25.57 | 25.01 |

Q6 Draw a graph of mass vs time.

Q7 What conclusion can you draw from the graph?

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Q8 Explain how your graph relates to Faraday’s first Law.

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Q9 Suggest a design for an experiment that tests the relationship between mass and current.

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