GCSE and IGCSE Chemistry: Electrolysis Worksheet

Year 10-11 · GCSE (AQA 4.4.3) and Cambridge IGCSE 0620 topic 4 · Exam-style questions

Name: ..... **Class:** ..... **Date:** ..... **Score:** / 49

Section A: Key ideas [8 marks]

electrolyte | anode | cathode | ions | molten | inert | reduction | oxidation

1 Use words from the box to complete the sentences. You may use a word once, more than once or not at all.

(a) Electrolysis is the breaking down of an ionic compound using electricity. The liquid that conducts is called the ..... . **[1]**

(b) Positive ions move to the negative electrode, which is called the ..... . **[1]**

(c) Negative ions move to the positive electrode, called the ..... . **[1]**

(d) Ionic solids do not conduct, but they conduct when ..... or dissolved in water because the ..... are free to move. **[2]**

(e) Positive ions gain electrons at the cathode, so this is ..... . **[1]**

2 Explain why solid sodium chloride does not conduct electricity but molten sodium chloride does. **[2]**

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Section B: Molten electrolytes [11 marks]

3 Molten lead bromide is electrolysed using inert (graphite) electrodes.

(a) Name the product at the cathode and the product at the anode. **[2]**

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(b) Write half equations for the reactions at each electrode. Use e^- for an electron. **[4]**

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(c) State which electrode is oxidation and explain why. **[2]**

4 Molten sodium chloride is electrolysed. Name the products and give a test for the gas formed. **[3]**

Section C: Aqueous solutions [16 marks]

5 Complete the table for the electrolysis of aqueous solutions using inert electrodes. **[8]**

Electrolyte	Product at cathode	Product at anode
Copper sulfate solution		
Sodium chloride solution (brine)		
Dilute sulfuric acid		
Potassium iodide solution		

6 Explain why hydrogen, not sodium, is produced at the cathode when sodium chloride solution is electrolysed. **[2]**

7 Copper is purified by electrolysis using copper electrodes in copper sulfate solution. Describe what happens at each electrode. **[3]**

8 A steel spoon is silver plated. Describe how, giving the electrolyte and the electrodes. **[3]**

Section D: Industrial electrolysis [14 marks]

9 Aluminium is extracted by electrolysis of aluminium oxide dissolved in molten cryolite. Explain why cryolite is used. **[2]**

10 The anodes in aluminium extraction have to be replaced regularly. Explain why. **[2]**

11 Write half equations for the extraction of aluminium: (a) at the cathode, (b) at the anode. **[4]**

12 Brine (sodium chloride solution) is electrolysed in industry. Name the three products and give one use of each. **[6]**