2.8 Electrolysis of Molten and Aqueous Compounds: 10-minute Pack

Total Marks

EDEXCEL 4CH1 · Calculator allowed · about 10 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Describe, in the context of electrolysis in a chemistry laboratory, what is meant by the term 'electrolysis'.

(Total for Question 1 is 2 marks)

2 A technician cools molten lithium chloride until it becomes a solid. State why the solid cannot carry current by ion movement in the electrolysis cell.

(Total for Question 2 is 1 mark)

3 In an aqueous sodium sulfate electrolysis cell with a direct-current supply, state the charge of the anode.

(Total for Question 3 is 1 mark)

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4 When molten zinc chloride is electrolysed with inert electrodes, name the gas produced at the positive electrode.

(Total for Question 4 is 1 mark)

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5 Predict the products formed at the cathode and at the anode during the electrolysis of molten lead(II) bromide, $PbBr_2$, using inert electrodes. Describe briefly what is discharged at each electrode.

(Total for Question 5 is 4 marks)

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Mark scheme · 2.8 Electrolysis of Molten and Aqueous Compounds: 10-minute Pack

Question 1

an electrical method that uses an external direct current to cause a chemical change **B1**

specifically, it causes ions to move to electrodes and be discharged producing elements or new substances **B1**

Answer: Electrolysis is the use of an external direct current to cause a chemical change by moving ions to electrodes where they are discharged to make elements or new substances.

Question 2

the ions are fixed in position and cannot move through the solid **B1**

Answer: The ions are fixed in position and cannot move through the solid.

Question 3

positive charge **B1**

Answer: Positive.

Question 4

chlorine gas (Cl_2) **B1**

Answer: Chlorine gas (Cl_2).

Question 5

at the cathode: Pb^{2+} ions are discharged to form lead metal **B1**

at the anode: Br^- ions are discharged to form bromine gas, Br_2 **B1**

states lead metal is produced at the negative electrode and bromine gas at the positive electrode **B1**

correct mention that electrodes are inert so products come from the molten ions only **B1**

Answer: Cathode: Pb^{2+} discharged to Pb metal. Anode: Br^- discharged to Br_2 gas. Inert electrodes mean products are from the ions in the melt.

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