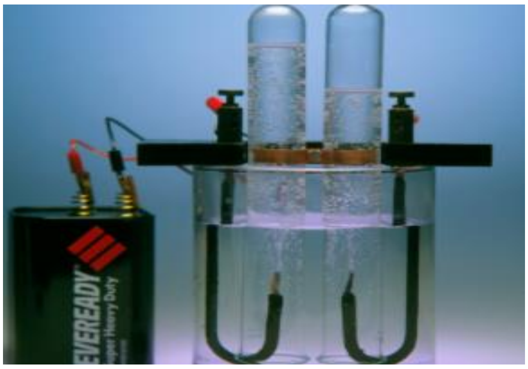
Checkpoint task: Electrolysis (14 marks available)

Read each question carefully and attempt each question to the best of your ability.

Underline appropriate key words in order to help you understand the question



Select the correct definition for electrolysis.

- ○ Forming a substance using electricity
- ○ Melting a substance using electricity
- ○ Breaking down a substance using electricity
- ○ Reacting two substances to generate electricity

2 Which word describes the positive electrode?

- ○ anode
- ○ electrolyte
- ○ aqueous
- ○ cathode

3 Select the type of bond that is found in substances that can be electrolysed.

- ○ ionic
- ○ metallic
- ○ covalent
- ○ alloy

4 Which equation represents the overall reaction in the electrolysis of molten Aluminium oxide (or Aluminium ore)?

- ○ aluminium oxide + water → aluminium + oxygen + hydrogen
- ○ aluminium + oxygen → aluminium oxide
- ○ aluminium oxide → aluminium + oxygen
- ○ aluminium + oxygen + hydrogen → aluminium oxide + water

5 Which sentence about what happens during electrolysis is correct?

- ○ Substances are broken down into atoms and move to negatively charged electrodes.
- ○ Substances are broken down into ions and move to neutral electrodes.
- ○ Substances are broken down into ions and move to oppositely charged electrodes.
- ○ Substances are broken down into elements and move to oppositely charged electrodes.

6 What moves through the electrolyte to the electrodes when a substance is electrolysed?

- protons
- ions
- atoms
- electrons

7 Which statement about electrolysis is true?

- During electrolysis, water molecules break down into H^+ and OH^- ions.
- Ionic compounds in solution can never be electrolysed.
- Only metals higher than hydrogen in the reactivity series are deposited from aqueous solutions.
- During the electrolysis of aqueous magnesium hydroxide, magnesium is deposited.

8 Molten sodium chloride can be electrolysed to form sodium and chlorine. Which is the correct equation for this electrolysis?

- $NaCl(l) \rightarrow Na(l) + Cl_2(g)$
- $2Na(l) + Cl_2(g) \rightarrow 2NaCl(l)$
- $Na(l) + Cl_2(g) \rightarrow NaCl(l)$
- $2NaCl(l) \rightarrow 2Na(l) + Cl_2(g)$

9 Which of these ions would be discharged at the cathode first?

- chloride ions
- sodium ions
- hydrogen ions
- hydroxide ions

10 Which statement about the extraction of aluminium is correct?

- ○ Aluminium forms at the anode.
- ○ Aluminium must be extracted using electrolysis as it is less reactive than carbon.
- ○ Oxygen reacts with the anode to form carbon dioxide.
- ○ Bauxite is added to reduce the melting temperature.

11 Which statement about what happens at the electrodes during electrolysis is correct?

- ○ Ions form neutral elements at the positive electrode.
- ○ Ions lose electrons at the negative electrode.
- ○ Ions are reduced at the positive electrode.
- ○ Ions are oxidised at the negative electrode.

12 Which ion will undergo oxidation during electrolysis?

- ○ Na
- ○ Al^{3+}
- ○ Cl^{-}
- ○ H^{+}

13 Which pair of half equations correctly represents the electrolysis of molten aluminium oxide, Al_2O_3?

- At the cathode: $2O^{2-}(l) \rightarrow O_2(g) + e^-$
  At the anode: $Al^{3+}(l) + 3e^- \rightarrow Al(l)$
- At the cathode: $Al^{3+}(l) + 3e^- \rightarrow Al(l)$
  At the anode: $2O^{2-}(l) \rightarrow O_2(g) + 4e^-$
- At the cathode: $Al^{3+}(l) + 3e^- \rightarrow Al(s)$
  At the anode: $2O^{2-}(l) \rightarrow O_2(l) + 4e^-$
- At the cathode: $Al^{2+}(l) + 2e^- \rightarrow Al(l)$
  At the anode: $2O^{2-}(l) \rightarrow O_2(g) + 4e^-$

14 Which reaction occurs at the anode during the electrolysis of brine, NaCl(aq)?

- $2H^+(aq) + 2e^- \rightarrow H_2(g)$
- $2Cl^-(aq) \rightarrow Cl_2(g) + 2e^-$
- $Na^+(aq) + e^- \rightarrow Na(l)$
- $4OH^-(aq) \rightarrow 2H_2O(l) + O_2(g) + 4e^-$

My score /14

My percentage ………..%

My grade ……..

WWW

EBI

MRI