

Chemistry Test

Electricity and chemistry

Section A (Multiple choice)

1. Which statement about electrolysis is correct?

- A Electrons move through the electrolyte from the cathode to the anode.
- B Electrons move towards the cathode in the external circuit.
- C Negative ions move towards the anode in the external circuit.
- D Positive ions move through the electrolyte towards the anode during electrolysis.

2. Three electrolysis cells are set up. Each cell has inert electrodes. The electrolytes are listed below.

cell 1 aqueous sodium chloride

cell 2 dilute sulfuric acid

cell 3 molten lead(II) bromide

In which of these cells is a gas formed at both electrodes?

- A 1and2
- B 1and3
- C 2only
- D 3only

3. Below are some metals in decreasing order of reactivity.

magnesium

zinc

iron

copper

Titanium reacts with acid and cannot be extracted from its ore by heating with carbon.

Where should titanium be placed in this list?

A below copper

B between iron and copper

C between magnesium and zinc

D between zinc and iron

4. Electricity is passed through molten sodium chloride. Inert electrodes are used.

What is formed at the negative electrode?

A chlorine

B hydrogen

C oxygen

D sodium

5. Which substance is not involved in the extraction of aluminium from bauxite?

A graphite

B cryolite

C Alumina

D nitrogen

6. Which metal could not be used for electroplating by using an aqueous solution?

A chromium

B copper

C silver

D sodium

7. Which products are formed at the electrodes when a concentrated solution of sodium chloride is electrolysed?

A chlorine and Hydrogen	B Sodium and Oxygen
C oxygen and Hydrogen	D sodium and chlorine

8. A student wishes to electroplate an object with copper.

What is correct pair?

A Anode is object and cathode is Copper	B Anode is copper and cathode is object
C Anode is copper and Cathode is Graphite	D Anode is graphite and Cathode is Copper

9. Which substance will not conduct electricity?

A aluminium

B copper

C plastic

D steel

10. Which products are formed at the anode and cathode when electricity is passed through molten lead(II) bromide?

anode (+)	cathode (-)
bromide ions	lead ions
bromine molecules	lead atoms
lead atoms	bromine molecules
lead ions	bromide ions

Section B

1. There are three products of the electrolysis of concentrated aqueous sodium chloride. Hydrogen is one of them.

(i) Write an equation for the electrode reaction which forms hydrogen.

..... [2]

(ii) Name the other two products of the electrolysis of concentrated aqueous sodium chloride and give a use of each one.

product use

product use [4]

2. Aluminium is an important metal with a wide range of uses.

(a) Aluminium is obtained by the electrolysis of aluminium oxide dissolved in molten cryolite.

(i) Solid aluminium oxide is a poor conductor of electricity. It conducts either when molten or when dissolved in molten cryolite. Explain why.

.....
.....
..... [2]

(ii) Why is a solution of aluminium oxide in molten cryolite used rather than molten aluminium oxide?

..... [1]

(iii) Explain why the carbon anodes need to be replaced periodically.

..... [1]

(iv) One reason why graphite is used for the electrodes is that it is a good conductor of electricity. Give another reason.

..... [1]

(b) Aluminium is used to make food containers because it resists corrosion.

Explain why it is not attacked by the acids in food.

.....
..... [2]

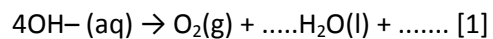
3. The diagram below shows the electrolysis of dilute sulfuric acid. Hydrogen is formed at the negative electrode (cathode) and oxygen at the positive electrode (anode) and the concentration of sulfuric acid increases.

The ions present in the dilute acid are $\text{H}^+(\text{aq})$, $\text{OH}^-(\text{aq})$ and $\text{SO}_4^{2-}(\text{aq})$.

(i) Write an equation for the reaction at the negative electrode (cathode).

..... [2]

(ii) Complete the equation for the reaction at the positive electrode (anode).



(iii) Suggest an explanation of why the concentration of the sulfuric acid increases.

..... [1]

4. Explain electroplating. If you are having a toy of copper and you want it to look good as like silver, what should you do so that the toy appears like silver. Use diagram and equations to explain your working.