

# Aluminium

## Question Paper

Level	O Level
Subject	Chemistry
Exam Board	Cambridge International Examinations
Topic	Metals
Sub-Topic	Aluminium
Booklet	Question Paper

**Time Allowed:** 18 minutes

**Score:** /15

**Percentage:** /100

1 Which gases are all present at the positive electrode during the manufacture of aluminium?

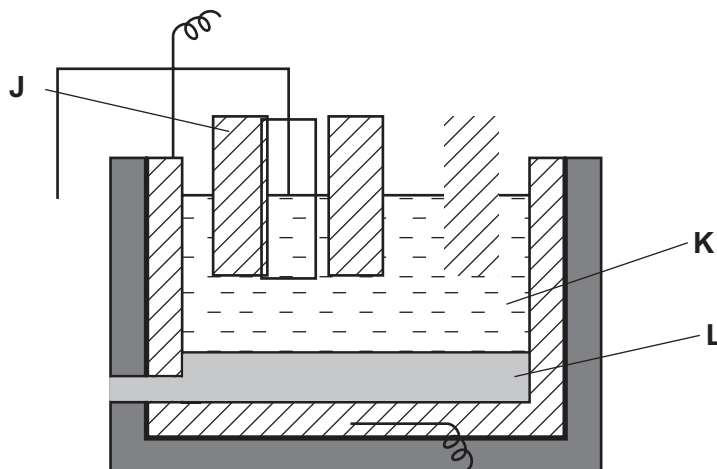
- A CO, H<sub>2</sub>, CO<sub>2</sub>
- B CO, SO<sub>2</sub>, H<sub>2</sub>O
- C O<sub>2</sub>, CO, CO<sub>2</sub>
- D SO<sub>2</sub>, H<sub>2</sub>, O<sub>2</sub>

2 An alloy of aluminium is used in the construction of aircraft.

Why is pure aluminium never used?

- A Pure aluminium cannot be manufactured.
- B Pure aluminium conducts electricity.
- C Pure aluminium is less dense than its alloys.
- D Pure aluminium is too malleable.

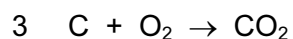
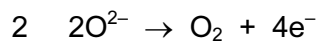
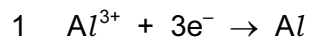
3 The diagram shows apparatus that can be used to extract aluminium.



What are J, K and L?

	J		L
A	negative electrode	aluminium oxide + cryolit	aluminium
B	negative electrode	cryolite	aluminium oxide
C	positive electrode	aluminium oxide	cryolite
D	positive electrode	aluminium oxide + cryolit	aluminium

- 4 In the electrolysis of molten aluminium oxide for the extraction of aluminium, the following three reactions take place.



Which reactions take place at the positive electrode?

- A** 1 only      **B** 2 only      **C** 1 and 3 only      **D** 2 and 3 only

- 5 Aluminium is manufactured by the electrolysis of molten aluminium oxide.

Which gas is **not** formed during this process?

- A** carbon dioxide  
**B** carbon monoxide  
**C** oxygen  
**D** sulfur dioxide

- 6 Which gases are formed during the production of aluminium by electrolysis of molten aluminium oxide?

- A** carbon dioxide, carbon monoxide, oxygen  
**B** carbon dioxide, carbon monoxide, sulfur dioxide  
**C** carbon dioxide, oxygen, sulfur dioxide  
**D** carbon monoxide, oxygen, sulfur dioxide

- 7 Which statement about the material used for aircraft bodies is correct?

Aircraft bodies are made from

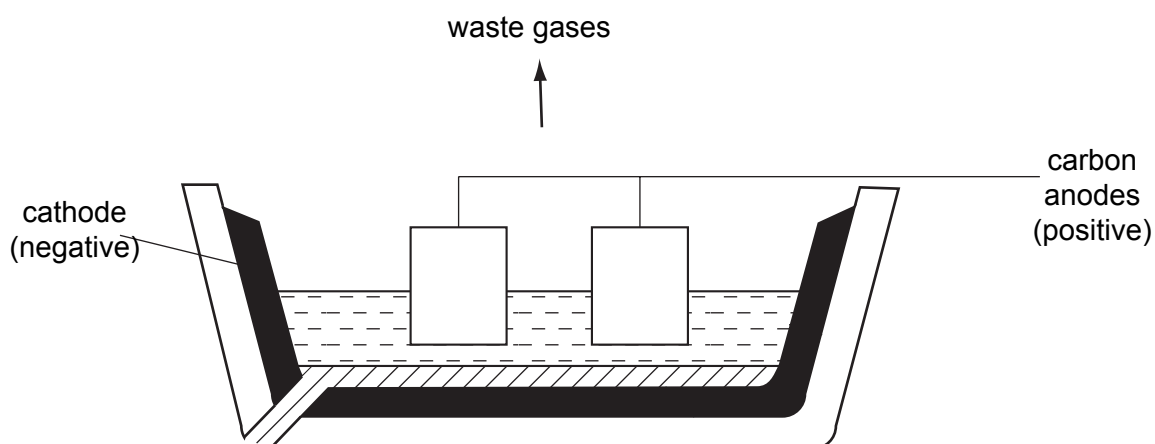
- A** an aluminium alloy because pure aluminium is too soft.  
**B** pure aluminium because of its high melting point.  
**C** pure aluminium because of its low density.  
**D** pure aluminium because of its resistance to corrosion.

- 8 In the electrolysis of aluminium oxide to extract pure aluminium a compound called cryolite is first added to the oxide.

What is the reason for adding the cryolite?

- A to reduce the corrosion of the carbon electrodes by oxygen
- B to reduce energy costs
- C to enable the aluminium ions and oxygen ions to move to the electrodes
- D to prevent the aluminium formed from being oxidised back to aluminium oxide

- 9 The diagram shows the electrolytic production of aluminium.



What are the products at the electrodes?

	negative electrode	positive electrode
A	solid aluminium	hydrogen
B	solid aluminium	oxygen
C	liquid aluminium	hydrogen
D	liquid aluminium	oxygen

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10 Aluminium is used to make saucepans because of its apparent lack of reactivity.

Which property of aluminium explains its unreactivity?

- A It has a high electrical conductivity.
- B It has a low density.
- C It has a surface layer of oxide.
- D It is in Group III of the Periodic Table.

11 Zinc and aluminium both react with dilute hydrochloric acid.

Why does zinc react more quickly than aluminium?

- A Aluminium is lower than hydrogen in the reactivity series.
- B Aluminium has an oxide coating.
- C Zinc is an amphoteric element.
- D Zinc is a transition metal.

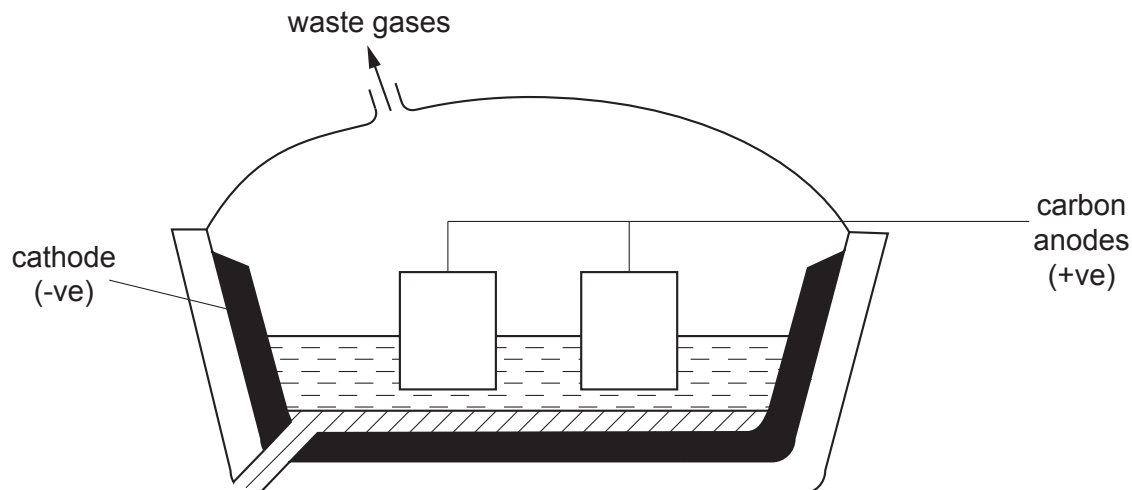
12 Which statement about the extraction of aluminium from aluminium oxide is correct?

- A Aluminium is extracted by heating its oxide with carbon.
- B Aluminium is extracted using electrolysis and is collected at the anode (positive electrode).
- C Aluminium is extracted using platinum electrodes and direct current.
- D Molten cryolite is used as a solvent for aluminium oxide.

13 From your knowledge of the manufacture of both aluminium and iron, what is the order of chemical reactivity of aluminium, carbon and iron towards oxygen?

	most reactive	→	least reactive
<b>A</b>	aluminium	carbon	iron
<b>B</b>	aluminium	iron	carbon
<b>C</b>	carbon	aluminium	iron
<b>D</b>	carbon	iron	aluminium

14 The diagram shows the electrolytic production of aluminium.



What is the physical state of the aluminium oxide and aluminium during this process?

	aluminium oxide	aluminium
<b>A</b>	liquid	liquid
<b>B</b>	liquid	solid
<b>C</b>	solid	liquid
<b>D</b>	solid	solid

15 Why does aluminium have an apparent lack of reactivity?

- A** Aluminium has a coating of aluminium oxide, preventing further reaction.
- B** Aluminium has a giant molecular structure that is too hard to break.
- C** Aluminium is low in the reactivity series.
- D** The activation energy for the reaction of aluminium with other elements is too high.