AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 5.2.2.8

Metals as conductors

Past-paper questions

Tier	**Higher**
Question groups	**2**
Available paper years	**2022–2025**

Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

Name: _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

5.2.2.8 Metals as conductors

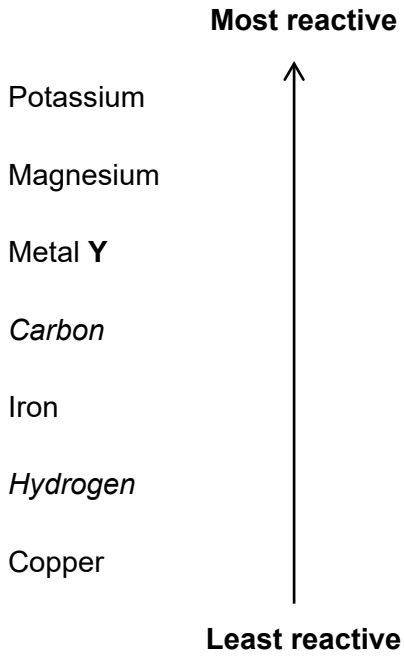
Question 01

June 2022 | 8464/C/1H | Original Q7

0 7 This question is about elements and compounds.

0 7 . 1 **Figure 8** shows a reactivity series.

Figure 8



Give the method and conditions used to extract metal **Y** from a compound of metal **Y**.

[2 marks]

Question 7 continues on the next page

5.2.2.8 Metals as conductors

Question 01 · continued June 2022 | 8464/C/1H | Original Q7

Sodium reacts with titanium chloride ($TiCl_4$) to produce titanium.

0 7 . 2 Complete the equation.

You should balance the equation.

[2 marks]

____ Na + $TiCl_4$ → _____ + _____

0 7 . 3 The reaction between sodium and titanium chloride is a redox reaction.

Write a half-equation to show that sodium is oxidised in this reaction.

[2 marks]

_____

5.2.2.8 Metals as conductors

Question 01 · continued

0 7 . 4 108 g of aluminum reacts with 1.21 kg of copper chloride to produce copper.

The equation for the reaction is:

$$2\,Al + 3\,CuCl_2 \rightarrow 3\,Cu + 2\,AlCl_3$$

Calculate the maximum mass of copper produced in grams (g).

You should determine the limiting reactant.

Relative atomic masses (A_r): Al = 27 Cu = 63.5

Relative formula masses (M_r): $CuCl_2$ = 134.5 $AlCl_3$ = 133.5

[6 marks]

Limiting reactant is _____

Mass of copper = _____ g

Question 7 continues on the next page

5.2.2.8 Metals as conductors

Question 01 · continued

Sodium metal and sodium chloride are both able to conduct electricity.

0 7 . 5 Describe how sodium metal conducts electricity.

[2 marks]

0 7 . 6 Explain how sodium chloride can conduct electricity.

[3 marks]

17

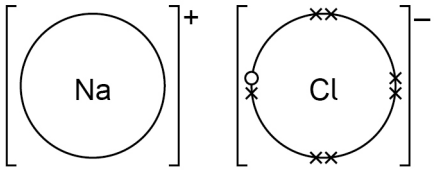
5.2.2.8 Metals as conductors

Question 02

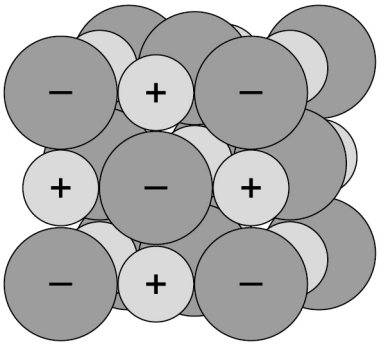
0 7 This question is about bonding and structures.

0 7 . 1 **Figure 10** represents two models of sodium chloride.

Figure 10



Model **A**



Model **B**

Give **two** limitations of model **A** compared with model **B**.

[2 marks]

1 _____

_____

2 _____

_____

0 7 . 2 Aluminium sulfate consists of the ions:

- Al^{3+}
- SO_4^{2-}

What is the formula of aluminium sulfate?

[1 mark]

_____

5.2.2.8 Metals as conductors

Question 02 · continued

0 7 . 3 Metals have metallic bonding.

Suggest **one** reason why aluminium metal conducts electricity better than sodium metal.

[1 mark]

0 7 . 4 Silicon dioxide and the polymer poly(ethene) are solid substances.

Compare silicon dioxide with the polymer, poly(ethene).

Answer in terms of structure and bonding.

[4 marks]

Extra space

8