

(Relative formula mass (M_r))

Q1. (2018)

A company uses chlorine to produce titanium chloride from titanium dioxide.

What is the relative formula mass (M_r) of titanium dioxide, TiO_2 ?

Relative atomic masses (A_r): O = 16 Ti = 48

[1 mark]

Tick **one** box.

64

☐

80

☐

128

☐

768

☐

Q2. (2018)

The company calculates that 500 g of titanium dioxide should produce 1.2 kg of titanium chloride.

However, the company finds that 500 g of titanium dioxide only produces 900 g of titanium chloride.

Calculate the percentage yield.

[2 marks]

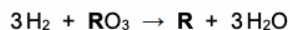
Percentage yield = _____ %

Q3.a)(2021)

This question is about the extraction of metals.

Element **R** is extracted from its oxide by reduction with hydrogen.

The equation for the reaction is:



The sum of the relative formula masses (M_r) of the reactants ($3\text{H}_2 + \text{RO}_3$) is 150

Calculate the relative atomic mass (A_r) of **R**.

Relative atomic masses (A_r): H = 1 O = 16

[2 marks]

Relative atomic mass (A_r) of **R** = _____

Q3.b)(2021)

Identify element **R**.

You should use:

- your answer to **question 10.1**
- the periodic table.

[1 mark]

Identity of **R** = _____

Q4.(2022)

Calculate the relative formula mass (M_r) of carbonic acid (H_2CO_3).

Relative atomic masses (A_r): H = 1 C = 12 O = 16

[2 marks]

Relative formula mass (M_r) = _____

Q5.(2023)

Iron oxide is reduced in this reaction.

How does the equation show that iron oxide is reduced?

[1 mark]

Q6.(2024)

Calculate the percentage (%) by mass of copper in copper sulfate (CuSO_4).

Give your answer to 3 significant figures.

Relative atomic mass (A_r): Cu = 63.5

Relative formula mass (M_r): CuSO_4 = 159.5

[3 marks]

Percentage by mass (3 significant figures) = _____ %

Q7. (2024)

Calculate the relative formula mass (M_r) of aluminium oxide (Al_2O_3).

Relative atomic masses (A_r): O = 16 Al = 27

[2 marks]

Relative formula mass (M_r) = _____