

AQA, OCR, Edexcel

GCSE Science

GCSE Chemistry

Moles

Answers

M M E

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Total Marks: /34

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Moles

Q1: What are the units chemical quantities are often measured in?

A= Moles

(1 mark)

Q2: What is the symbol for this unit?

A= mol

(1 mark)

Q3: Complete the following, the first is given as an example.

A)

Compound: NaOH Relative Formula Mass: 40 Mass of one mole: 40

B)

Compound: CO ₂

Relative Formula Mass: 44

Mass of 3CO ₂ : 132

C)

Compound: Na ₂ SO ₄

Relative Formula Mass: 142.04

Mass of one 2Na ₂ SO ₄ : 284.08
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(6 marks)

Q4: In a mole of one substance and in the mole of another, is the number of particles, atoms, molecules or ions the same, less or more?

A= the same

(1 mark)

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Q5: What is the Avogadro constant?

A= the Avogadro constant is the number of atoms, molecules or ions in a mole of a given substance.

(1 mark)

Q6: What is numerical value of the Avogadro constant?

A= 6.02×10^{23}

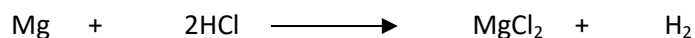
(1 mark)

Amounts of substances in equations

The masses of substances in an equation can be calculated using the following equation:

$$\text{Mass} = \text{relative formula mass} \times \text{amount}$$

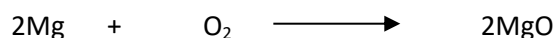
Q7: Using the following equation and the periodic table, give the mass of each reactant and product.



Substance	Mass
Mg	24.3
2HCl	72.92
MgCl ₂	95.211
H ₂	2.016

(4 marks)

Q8: 48g of magnesium and 32g of oxygen react to form 80g of magnesium oxide.



What mass of oxygen is needed to make 20g of MgO?

$$80/4 = 20 \text{ (1 mark)}$$

$$32/4 = 8 \text{ (1 mark)}$$

A= 8g

(2 marks)

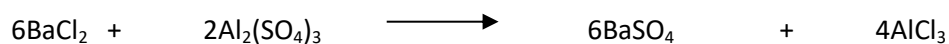
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Using moles to balance equations

$$\text{Number of moles} = \frac{\text{mass}}{\text{molar mass}}$$

Q9: Using this equation and the following information, balance the following equation.

1248g of barium chloride reacts with 684g of aluminium sulphate, forming 1398g of barium sulphate and 534g of aluminium chloride. Balance the equation below.



Molar mass of barium chloride = $137.32 + (35.45 \times 2) = 208.2$

Number of moles = 6

Then balance accordingly.

1 mark for each correct number of moles.

(4 marks)

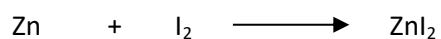
Limiting reactants

Q10: Describe what is meant by the term 'a limiting reactant'.

A= In a chemical reaction, using one reactant in excess to ensure the other reactant is used (1 mark).
The reactant that is completely used up is called the limiting reactant (1 mark), because it limits the amount of products (1 mark).

(3 marks)

Q11: In the following equation:



If 3 moles of zinc are used and only 1 mole of iodine, what is the mass of the product, zinc iodide?

A= 1 mole of ZnI_2 because 1 mole of iodine used. (1 mark)

A= Calculates relative formula mass, 319.22 (1 mark)

(2 marks)

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Concentration of solutions

Q12: How is the concentration of a solution measured?

A= Measured in mass (1 mark) per given volume of solution (1 mark)

e.g. grams per dm^3 (giving the unit gets both marks)

(2 marks)

Q13: Write this in an equation form, including the units.

$$\text{Concentration} = \frac{\text{Mass (grams) (1 mark)}}{\text{Volume of solution (1 mark)}}$$

(2 marks)

Q14: Calculate the amount of sodium chloride, NaCl, in 55.0cm^3 concentration $0.5\text{mol}/\text{dm}^3$.

A= convert volume to $\text{dm}^3 = 0.055\text{dm}^3$ (1 mark).

Mass = concentration x volume. $0.5 \times 0.055 = 0.0275\text{grams}$ (1 mark).

(2 marks)