



Essential Pre-Uni Chemistry B4.1



Find the molar masses in amu of the following compounds.

Part A CaCO_3

CaCO_3 , to 4 significant figures.

Part B Na_2CO_3

Na_2CO_3 , to 3 significant figures.

Part C NaOH

NaOH , to 2 significant figures.

Part D HCl

HCl , to 3 significant figures.

Part E H_2SO_4

H_2SO_4 , to 3 significant figures.

Part F FeSO_4



FeSO_4 , to 3 significant figures.

Part G KMnO_4



KMnO_4 , to 3 significant figures.

Part H $\text{Fe}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$



$\text{Fe}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$ (the 5 means that the formula includes 5 of what follows, i.e. water, so total mass is for $\text{Fe}_2\text{O}_3 + 5 \times \text{H}_2\text{O}$), to 4 significant figures.

Part I **Calcium hydroxide**



Calcium hydroxide, to 3 significant figures.

Part J **Butane**



Butane, to 2 significant figures.



Essential Pre-Uni Chemistry B4.2

GCSE



A Level



Calculate the mass of the following compounds. Give your answers to the appropriate number of significant figures.

Part A (a)

0.25 moles of H_2O_2 (l), to 2 significant figures.

Part B (b)

6.0 moles of C_2H_6 (g), to 2 significant figures.

Part C (c)

0.40 moles of H_2O (l), to 2 significant figures

Part D (d)

20.0 moles of Sr (s), to 3 significant figures.

Part E (e)

1.20 moles of aluminium oxide, to 3 significant figures.

7.4 moles of ammonium sulfate, to 2 significant figures.



Essential Pre-Uni Chemistry B5.1



Calculate the concentration in mol dm^{-3} of the following solutions:

Part A (a)

0.40 g NaOH in 100 ml water

Part B (b)

7.3 g HCl in 1000 ml water

Part C (c)

2.5 g H_2SO_4 in 50 ml water

Part D (d)

15 g FeSO_4 in 500 ml water, to 2 significant figures

Part E (e)

0.16 g KMnO_4 in 200 ml



Essential Pre-Uni Chemistry A2.6



Assume that the mass of an isotope in amu to 3 significant figures is equal to its mass number.

The relative molecular mass of compound M is 135 amu. M contains 3.7% hydrogen, 44.4% carbon and 51.9% nitrogen by mass.

Find the molecular formula of M.



Essential Pre-Uni Chemistry A2.7



Assume that the mass of an isotope in amu to 3 significant figures is equal to its mass number.

Complete combustion of compound N occurs in a stoichiometric ratio of 1 : 6 with oxygen gas. Complete combustion of 4.2 g of compound N produces 13.2 g of carbon dioxide and 5.4 g of water.

Find the molecular formula of N.



Essential Pre-Uni Chemistry A1.1



Find the empirical formulae for the ten compounds in Parts A - J, from the data given below. No compound contains more than 15 atoms in total in its formula. All compositions are by mass.

| Element | Atomic Mass | Element | Atomic Mass |
|----------|-------------|-----------|-------------|
| Hydrogen | 1.0 | Chlorine | 35.5 |
| Carbon | 12.0 | Potassium | 39.1 |
| Nitrogen | 14.0 | Vanadium | 50.9 |
| Oxygen | 16.0 | Chromium | 52.0 |
| Sulfur | 32.1 | Lead | 207.2 |

Part A 35.0% Nitrogen, 5.0% Hydrogen, 60.0% Oxygen

35.0% Nitrogen, 5.0% Hydrogen, 60.0% Oxygen

Part B 90.7% Lead, 9.3% Oxygen

90.7% Lead, 9.3% Oxygen

Part C 26.6% Potassium, 35.3% Chromium, 38.1% Oxygen

26.6% Potassium, 35.3% Chromium, 38.1% Oxygen

Part D 40.3% Potassium, 26.8% Chromium, 32.9% Oxygen

40.3% Potassium, 26.8% Chromium, 32.9% Oxygen

Part E 29.4% Vanadium, 9.2% Oxygen, 61.4% Chlorine



29.4% Vanadium, 9.2% Oxygen, 61.4% Chlorine

Part F 81.8% Carbon, 18.2% Hydrogen



81.8% Carbon, 18.2% Hydrogen

Part G 38.7% Carbon, 9.7% Hydrogen, 51.6% Oxygen



38.7% Carbon, 9.7% Hydrogen, 51.6% Oxygen

Part H 77.4% Carbon, 7.5% Hydrogen, 15.1% Nitrogen



77.4% Carbon, 7.5% Hydrogen, 15.1% Nitrogen

Part I 25.9% Nitrogen, 74.1% Oxygen



25.9% Nitrogen, 74.1% Oxygen

Part J 29.7% Carbon, 5.8% Hydrogen, 26.5% Sulfur, 11.6% Nitrogen, 26.4% Oxygen



29.7% Carbon, 5.8% Hydrogen, 26.5% Sulfur, 11.6% Nitrogen, 26.4% Oxygen. In your answer, place the elements in the order just given.



Essential Pre-Uni Chemistry A1.2



Complete combustion of 6.4 g of compound K produced 8.8 g of carbon dioxide and 7.2 g of water.

Calculate the empirical formula of K.



Essential Pre-Uni Chemistry A1.3

A Level A Level



Complete combustion of 1.80 g of compound L produced 2.64 g of carbon dioxide, 1.08 g of water and 1.92 g of sulfur dioxide.

Calculate the empirical formula of L.