a

Mass of the p_____ must always equal the mass of the r_____.

Balance the following:

$$H_2 + O_2 \longrightarrow H_2O$$
$$Na + Cl_2 \longrightarrow NaCl$$
$$Br_2 + KI \longrightarrow I_2 + KBr$$
$$N_2 + H_2 \longrightarrow NH_3$$

b
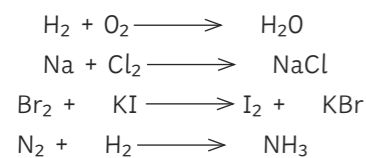
Complete the following sentences

The relative formula mass is the (_____) of a compound.

It is the sum of the r_____ atomic masses (A_r) of the atoms.

Calculate the relative formula mass for the following. Show your working out.

A_r of C = 12
A_r of H = 1
A_r of O = 16
A_r of N = 14

Example:
CO_2
$12 + (16 \times 2)$
$12 + 32$
$= 44$

H_2O

CH_4

NH_4NO_3

c

When a gas is produced during a reaction, why might the mass go down?
(Hint: think about where the gas may go)

_____
_____
_____

Write the equation for when magnesium reacts with oxygen.

_____

What happens to the mass of the product from the question above?

_____
_____
_____

d

$$\% \text{ mass} = \frac{A_r \times \text{number of atoms} \times 100}{M_r \text{ of the compound}}$$

Using the equation above, calculate the % mass of sodium (Na) in NaCl.

A_r of Na = 23

A_r of Cl = 35.5

e

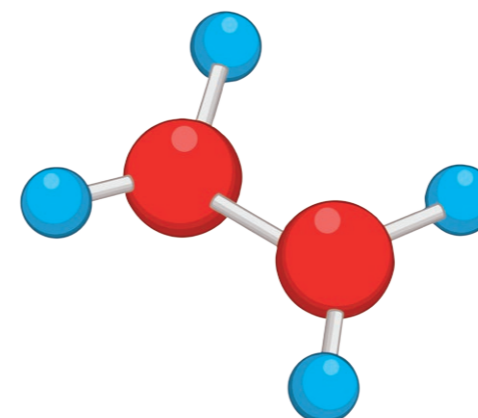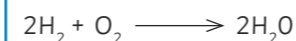If 9g of magnesium reacts completely with 6g of oxygen what is the mass of magnesium oxide produced?

1. 5g
2. 10g
3. 15g
4. 20g
5. 25g

f

Show that mass is conserved in the following equation.

Use the A_r values to calculate the M_r of both sides of the equation.

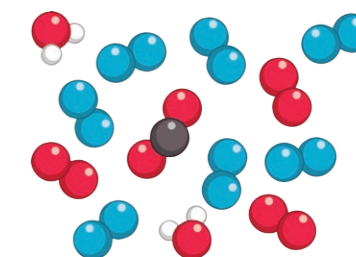A_r of H = 1

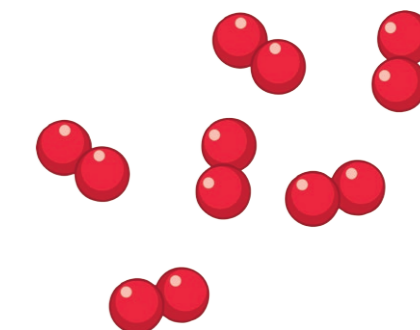A_r of O = 16

$$2H_2 + O_2 \longrightarrow 2H_2O$$

g

Complete the concentration equation.

concentration = _____

What is the concentration of a solution if there is 40g of dissolved substance and $0.5dm^3$ of solvent?
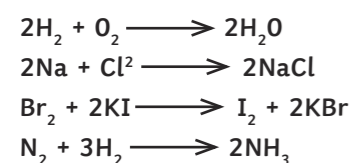
h

Rearrange the equation to calculate the mass of the dissolved substance when the concentration is $15g/dm^3$ and the volume is $0.8dm^3$.

a

Mass of the **product** must always equal the mass of the **reactants**.

Balance the following:

$$2H_2 + O_2 \longrightarrow 2H_2O$$
$$2Na + Cl^2 \longrightarrow 2NaCl$$
$$Br_2 + 2KI \longrightarrow I_2 + 2KBr$$
$$N_2 + 3H_2 \longrightarrow 2NH_3$$

b

Complete the following sentences

The relative formula mass is the (M_r) of a compound.

It is the sum of the **relative** atomic masses (A_r) of the atoms.

Calculate the relative formula mass for the following. Show your working out.

A_r of C = 12
A_r of H = 1
A_r of O = 16
A_r of N = 14

Example:
CO_2
12 + (16 × 2)
12 + 32
= 44

H_2O
(1 × 2) + 16
2 + 16
= 18

CH_4
12 + (1 × 4)
12 + 4
= 16

NH_4NO_3
14 + (1 × 4) + 14 + (16 × 3)
14 + 4 + 14 + 48
= 80

c

When a gas is produced during a reaction, why might the mass go down?
(Hint: think about where the gas may go)

The gas may be released into the environment.

Write the equation for when magnesium reacts with oxygen.

$$2Mg + O_2 \longrightarrow 2MgO$$

What happens to the mass of the product from the question above?

The mass increases because oxygen is added from the environment.

d

$$\% \text{ mass} = \frac{A_r \times \text{number of atoms} \times 100}{M_r \text{ of the compound}}$$

Using the equation above, calculate the % mass of sodium (Na) in NaCl.

A_r of Na = 23

A_r of Cl = 35.5

$$\% \text{ mass} = \frac{23 \times 1 \times 100}{23 + 35.5}$$

$$= \frac{2300}{58.5}$$

= 39.3% (to 1d.p.)

e

If 9g of magnesium reacts completely with 6g of oxygen what is the mass of magnesium oxide produced?

1. 5g
2. 10g
3. **15g**
4. 20g
5. 25g

f

Show that mass is conserved in the following equation.

Use the A_r values to calculate the M_r of both sides of the equation.

A_r of H = 1

A_r of O = 16
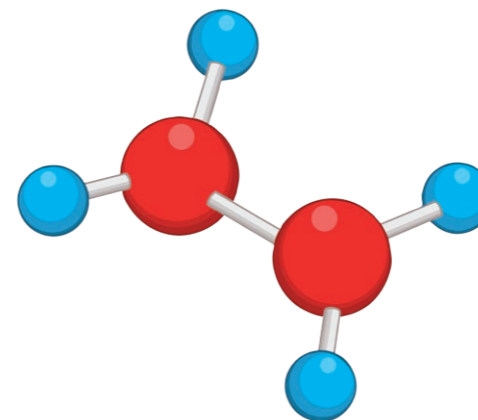
$$2H_2 + O_2 \longrightarrow 2H_2O$$

$$2 \times (1 \times 2) + (16 \times 2) \longrightarrow 2((1 \times 2) + 16)$$

$$4 + 32 \longrightarrow 2 \times 18$$

$$36 \longrightarrow 36$$
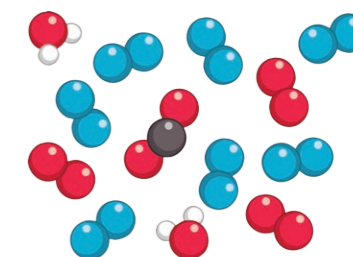
left-hand side = right-hand side

g

Complete the concentration equation.

$$\text{concentration} = \frac{\text{mass of dissolved substance}}{\text{volume of solvent}}$$

What is the concentration of a solution if there is 40g of dissolved substance and $0.5dm^3$ of solvent?

$$\text{concentration} = \frac{40}{0.5}$$

$$\text{concentration} = 80g/dm^3$$

h

Rearrange the equation to calculate the mass of the dissolved substance when the concentration is $15g/dm^3$ and the volume is $0.8dm^3$.

mass = concentration × volume

mass = 15 × 0.8

mass = 12g