The Mole - 2
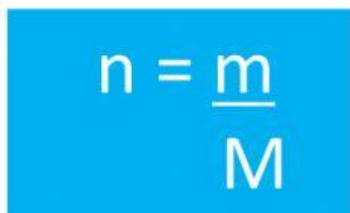
Before starting the next worksheet, watch this video to revise what we learnt yesterday about Molar Mass:

https://www.youtube.com/watch?v=hY7lzRBylSk

Calculating number of moles:

Now we are going to learn how to calculate the number of moles present in a certain mass of a pure substance (either a COMPOUND or an ELEMENT).
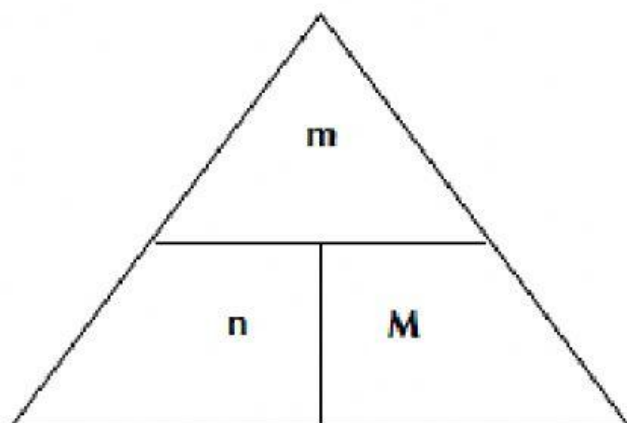
$$n = \frac{m}{M}$$

Where:

n = number of moles (Unit: mol)

m = mass of substance (Unit: g)

M = molar mass of substance (Unit: $g.mol^{-1}$)

We can use this triangle to help with calculations (note that the formula will be given to you in a test, but if you want the triangle you need to learn it):

Examples:

Eg 1) You have a sample that contains 5 moles of zinc. What is the mass of the zinc in the sample?

$m = n \times M$

$= 65 \text{ g.mol}^{-1} \times 5 \text{ mol}$

$= 325 \text{ g}$

Use the Periodic Table to find the Molar Mass of Zn.

2) Calculate the mass of 7,5 moles of Sodium metal

$m = n \times M$

$= 7,5 \quad \times$

$= \quad \text{g}$

3) Calculate the mass of 3,6 moles of $Ca(OH)_2$

$M = \quad + 2(\quad + \quad)$

$= \quad \text{g.mol}^{-1}$

First calculate the Molar Mass of $Ca(OH)_2$.

$m = n \times M$

$\quad = \qquad \times$

$\quad = \qquad g$

4)   Calculate the number of moles in 48 g of Magnesium metal

$n = m/M$

$\quad = \underline{48}$

$\quad = \qquad mol$

5)   Calculate the number of moles in 70 g of Aluminium metal

$n = m/M$

$\quad = \underline{\qquad}$

$\quad = \qquad mol$

6)   Calculate the number of moles of sulphur if you have 64 g.

$n = m/M$

$\quad = \underline{\qquad}$

$\quad = \qquad mol$

7)   Calculate the mass of 2,5 mol of water.

m = n x M

   =   x

   =   g

Don't forget you first need to calculate the Molar Mass of water!

Question 4

Give the molar mass of each of the following elements:

4.1   hydrogen gas   g.mol^{-1}

4.2   nitrogen gas   g.mol^{-1}

4.3   bromine gas   g.mol^{-1}

Hint: Don't forget the 7 naturally diatomic molecules!

Question 5

Calculate the number of moles in each of the following samples:

a. 22 g of boron (B)

n = m/M

   = _____

   =   mol

b. 55 g of manganese (Mn)

n = m/M

  = _____

  =   mol

c. 100,5 g of mercury (Hg)

n = m/M

  = _____

  =   mol

d. 50 g of barium (Ba)

n = m/M

  = _____

  =   mol

e. 40 g of lead (Pb)

n = m/M

  = _____

  =   mol