ATOMIC MASS OR FORMULA MASS:

Atomic mass is the sum of protons and neutrons in an atom.

Isotopes are atoms of the same element with the same number of protons but different number of neutrons

Relative atomic masses (RAM) is average atomic masses of isotopes of an element in the ratios of their existence.

Formula masses are calculated by adding together the masses of the constituent atoms in a molecule.

Example 1; What is the formula mass of ozone (O_3)?

Solution: the ozone molecule contains three oxygen atoms, each of which weights 16 grams. Therefore, the formula mass of ozone is: -
3 x 16 = 48 grams'

Example 2: What is the formula mass of ammonia, NH_3?

Solution: Nitrogen atoms weight 14 grams and hydrogen atoms weight 1 g. There are three hydrogen atoms in the molecule; Therefore, the formulae mass is
$14 + (3x1) = 17$ grams

Example 3: What is the formula mass of glucose $C_6H_{12}O_6$?

Solution: Carbon weights 12-gram, hydrogen 1 gram, oxygen 16 gram. The formula mass of glucose is: (6 x 12) + (12 x 1) + (6 x 16)

72 + 12 + 96 = 180 grams.

EXERCISE

Question 1; What is the formula mass of

i) ammonium sulphate [$(NH_4)_2SO_4$] ?
ii) $Ca(NO_3)_2$
iii) $Mg(OH)_2$
iv) $BaSO_4$
v) $K\,ClO_3$
vi) H_3PO_4
vii) NH_4NO_3

(Ca = 40, N = 14, O = 16, Mg = 24, H = 1, Ba = 137, S = 32, K = 39, Cl = 35.5, P = 31

Answers

Formula	Relative formula mass
i) $[(NH_4)_2SO_4]$?	2(14 + 1x 4) + 32 + 16 x 4 = 132
ii) $Ca(NO_3)_2$	40 + 2(14 + 16 x 3) = 102
iii) $Mg(OH)_2$	24 + 2(16 + 1) = 58
iv) $BaSO_4$	137 + 32 + 16 x 4 =233
v) $K\ ClO_3$	39 + 35.5 + 16 x 3 = 122.5
vi) H_3PO_4	1 x 3 + 31 + 16 x 4 = 98
vii) NH_4NO_3	14 + 1 x 4 + 14 + 16 x 3 = 80