SSLC -Chemistry -Class -13

Unit 2 : Gas Laws and Mole Concept

Calculation of the number of minute particles from mass

If the particles having the same size and mass, even though they are in crores, we can determine their accurate number on the basis of mass.

Thus we can calculate the number of particles on the basis of their masses .

Relative Atomic Mass

Look at the atomic mass of certain elements

Element	Hydrogen	Helium	Sodium
Atomic mass	1	4	23

The numbers given above are not the real mass of the atoms. But they are the relative atomic masses.

In this method, the mass of an atom is compared to the mass of another atom and expressed as a number which shows how many times it is heavier than the other atom. The atomic mass of elements are expressed by considering 1/12 mass of an atom of carbon-12 as one unit.

Eg:

(ELEMENT)	(RELATIVE ATOMIC MASS)
H	1
He	4
N	14
Na	23
Cl	35.5

Gram atomic Mass

Each element is taken with mass in grams equal to their atomic masses. The number of atoms (6.022×10^{23}) present in them are found to be equal.

(ELEMENT)	(ATOMIC MASS)	(MASS IN GRAMS)		(NUMBER OF ATOMS)
കാർബൺ (CARBON)	12	12g	1GAM	6.022×10^{23}
ഓക്സിജൻ (OXYGEN)	16	16g	1GAM	6.022×10^{23}
നൈട്രജൻ (NITROGEN)	14	14g	1GAM	6.022×10^{23}
ക്ലോറിൻ	35.5	35.5g	1GAM	6.022×10^{23}

One gram atomic mass of any element contains 6.022×10^{23} atoms. This number is known as Avagadro number. This is indicated as N_A.

Questions

1) The atomic mass of elements are expressed by considering $1/12^{th}$ mass of an atom of .....as one unit.

(Nitrogen-14, Helium-4 , carbon-12 , Oxygen-16)

2) Calculate the number of atoms present in each of the sample ?

a) 42g Nitrogen
b) 80g Oxygen

3)Which among the following is the Avagadro number ?

($6.022X10^{21}$, $6.022X10^{23}$, $6.022X10^{24}$)

4) How many atoms are present in70g Nitrogen ?

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