Average Atomic Mass

Recall- Atomic mass number (#p+#n)

$^{12}_{6}C$ or $^{13}_{6}C$ or $^{14}_{6}C$

isotopes

In nature, mix of isotopes

We use average atomic mass.

e.g. carbon – 12.01 a.m.u.

Calculate average molecular mass

e.g. NaCl

1-Na	22.99 u
1-Cl	35.45 u
	58.44 u

e.g. Na_2CO_3

2-Na	2x22.99 =	45.98
1-C	1x 12.01 =	12.01
3-O	3x 16.00 =	48.00
		105.99 u

Text - p.48 Mole → 6.02×10^{23}

Definition - An Avogadro's number of particles.

A mole of particles has an equivalent mass in grams (not u)

e.g.

molec.	mole
NaCl	NaCl molec.
58.44 u	58.44 g

Questions

P.57 #16-19 choose

Mole to Mass Calculations

Ex. 1 mol H_2O 2 mol H x 1.01 = 2.02

1 mol O x 16.00

Written - 18.02 g/mol 18.02 g

Ex. How many moles in 36.04 g H_2O

$$36.04\ g\ H_2O \times \frac{1\ mol\ H_2O}{18.02\ g\ H_2O} = 2\ mol\ H_2O$$

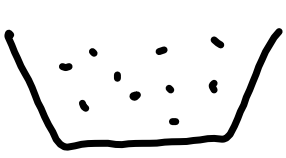
Ex. What is the mass of 4.6 mol of Na_2CO_3? 105.99 g/mol

$$4.6\ mol\ Na_2CO_3 \times \frac{105.99\ g}{1\ mol} = 487\ g\ Na_2CO_3$$

p. 59 # 20-25 (choose)

Concentration

$\frac{mol}{L}$



A

B

← more concentrated

Units $\frac{mol}{L}$ ← solute / volume

Stoichiometry- Molecule and Mole

Analogy - recipe

- can double or reduce

Example- $CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O$

1 molec. CH_4 combines 2 molec. O_2

1 molec. CH_4 produces 1 molec. CO_2 2 molec. H_2O

$1 : 2 : 1 : 2$

Ex. - How many molecules of CH_4 combine with 20 molecules O_2?

$$20 \text{ molec. } O_2 \times \frac{1 \text{ molec. } CH_4}{2 \text{ molec. } O_2} = 10 \text{ molec } CH_4$$

Read p. 110-117

Questions p. 114 #1 (a-c)

Select questions for discussion.

Questions p.26

13. c) $\overset{2(+)}{Li_2}\overset{-2}{O}$ – lithium oxide

16. b) mercury (II) sulfide → $\overset{2+}{Hg}\ \overset{2-}{S}$

17. c) $\overset{2(+)}{Na_2}\overset{-2}{SO_4}$ Sodium sulfate

10. c Diarsenic trisulfide

As_2S_3

21. c $2NH_3 + \frac{3}{2}O_2 \rightarrow N_2 + 3H_2O$

N – 2	N – 2
H – 6	H – 6
O – 3	O – 3