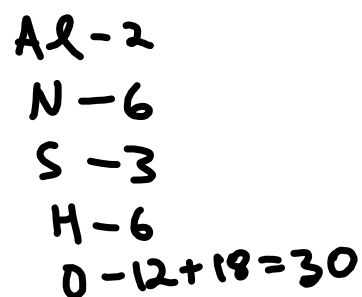
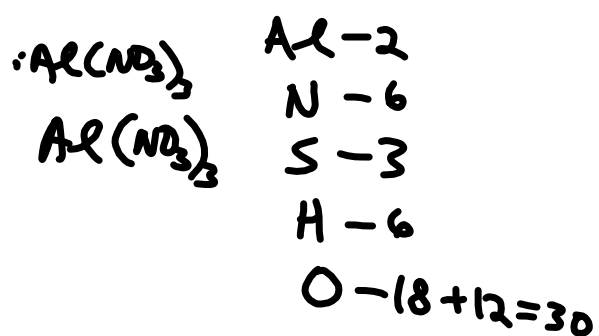


p.31 #21-d



Average Atomic Mass

Recall- Atomic Mass Number (#p + #n)



In nature - there is a mixture of isotopes.
We use average atomic mass.

e.g. Carbon 12.01 a.m.u.

e.g. Calculate the average molecular mass - atomic mass units (u)

e.g. NaCl

$$\begin{array}{r} \text{Na} - 22.99 \\ \text{Cl} - 35.45 \\ \hline 58.44 \text{ u} \end{array}$$

e.g. Na_2CO_3 -

$$\begin{array}{r} 2\text{Na} = 2 \times 22.99 = 45.98 \\ 1\text{-C} = 1 \times 12.01 = 12.01 \\ 3\text{-O} = 3 \times 16.00 = 48.00 \\ \hline 105.99 \text{ u} \end{array}$$

The Mole Text p. 48

Definition- An Avogadro's number of particles. $\approx 6.02 \times 10^{23}$

A mole of particles has an equivalent mass in g. (instead of a.m.u)

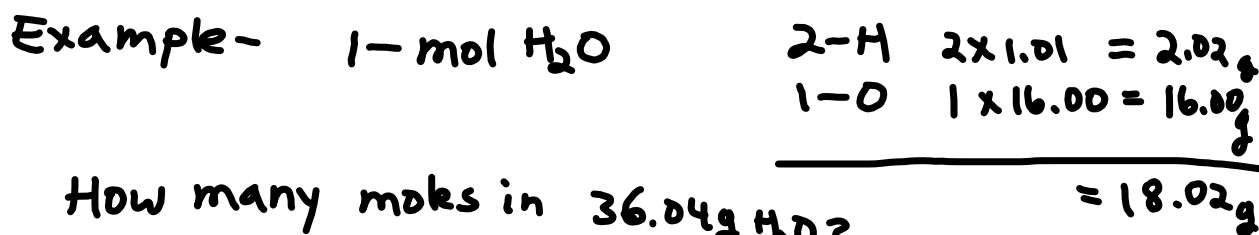
e.g.

Molecule	Mole
1-molecule NaCl 58.44 u	1-Mole NaCl particles 58.44 g

e.g. molar mass of $\text{Na}_2\text{CO}_3 = 105.99 \text{ g}$

Questions p. 57 # 16-19

Mole <--> Mass Calculations



$$36.04 \text{ g } \cancel{H_2O} \times \frac{1 \text{ mol } H_2O}{18.02 \text{ g } \cancel{H_2O}} = 2.00 \text{ mol } H_2O$$

↑
molar mass

Example - How many moles of Na_2CO_3 in 5.0 g of Na_2CO_3 ?

$$5.0 \text{ g } \cancel{Na_2CO_3} \times \frac{1 \text{ mol } Na_2CO_3}{105.99 \text{ g } \cancel{Na_2CO_3}} = 0.047 \text{ mol } Na_2CO_3$$

Example - What is the mass of $4.6 \text{ mol } Na_2CO_3$?

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

Questions p. 59 #20-25 (choose)

Concentration - mol/L



A



B (more concentrated)

Units $\frac{\text{mole}}{\text{L}}$
← solute
← volume

Stoichiometry - Molecule, Mole