

Ch 10 HW: Sec Asses 29-31 Rev Con 111,112
Sec 10.2A

obj: Use the mole to convert among measurements of mass, volume and particles.

Mole - Particles

$$- 1 \text{ mole} = 6.02 \times 10^{23} \text{ RP}$$

$$\frac{1 \text{ mole}}{6.02 \times 10^{23} \text{ RP}}, \quad \frac{6.02 \times 10^{23} \text{ RP}}{1 \text{ mole}}$$

11/5/02 7:50 AM

Mole - Mass

- 1 mole = gfm of the substance.
(Molar Mass)

$$\frac{1 \text{ mole}}{\text{gfm}}, \quad \frac{\text{gfm}}{1 \text{ mole}}$$

Mole - Volume

- Only works when the substance is a gas

- 1 mole of a gas @ STP = 22.4 L

$$\frac{1 \text{ mole}}{22.4 \text{ L}}, \quad \frac{22.4 \text{ L}}{1 \text{ mole}}$$

Nov 6 - 11:27 AM

- Molar Volume

* 1 mole of a gas @ standard Temp + pressure has a volume of 22.4L

* Standard Temp is $0^{\circ}\text{C} \Rightarrow 273\text{K}$

* Standard Pressure is 1 atm $\Rightarrow 101.3\text{kPa}$
 $\Rightarrow 760\text{ mmHg}$

1 mole gas = 22.4L @ STP

$$\frac{1 \text{ mole}}{22.4\text{L}}, \frac{22.4\text{L}}{1 \text{ mole}}$$

Nov 6 - 11:30 AM

What is the volume of 39g of N_2 @ STP?

Given

39g N_2

Wanted

Volume N_2

$$\frac{39\text{g N}_2}{28\text{g N}_2} \times \frac{1\text{mol N}_2}{1\text{mol N}_2} \times \frac{22.4\text{L N}_2}{1\text{mol N}_2}$$

$$\text{N}_2 - 2 \times 14\text{g} = 28\text{g}$$

How many CO_2 molecules are in 50L @ STP?

Given

50L CO_2

Wanted

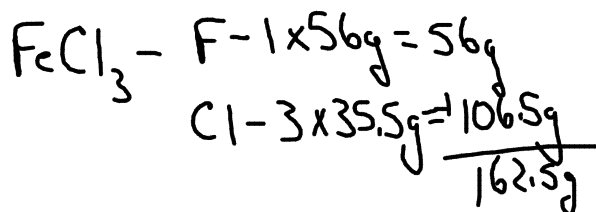
CO_2 molecules

$$\frac{50\text{L CO}_2}{22.4\text{L CO}_2} \times \frac{1\text{mol CO}_2}{1\text{mol CO}_2} \times \frac{6.02 \times 10^{23} \text{ molecules CO}_2}{1\text{mol CO}_2}$$

Nov 6 - 11:36 AM

Find the mass of 7.2×10^{23} Form. U. of FeCl_3 .

<u>Given</u> 7.2×10^{23} Form. U. FeCl_3	7.2×10^{23} Form. U. FeCl_3	1 mol FeCl_3	162.5g FeCl_3
<u>Wanted</u> mass FeCl_3		6.02×10^{23} Form. U. FeCl_3	1 mol FeCl_3



Nov 5 - 11:53 AM

Density of Gases

- Density in general is a ratio btw mass and volume.

$$D = \frac{m}{V}$$

- The Density of a gas depends on the gas's molar mass + molar volume.

* Conditions @ STP, molar Volume is 22.4L

$$D = \frac{\text{molar mass}}{\text{molar volume (22.4L)}} @ \text{STP}$$

$$D_{\text{NO}} = \frac{30\text{g}}{22.4\text{L}} = 1.34\text{g/L} \quad \text{NO} - \begin{array}{l} \text{N} - 1 \times 14\text{g} \\ \text{O} - 1 \times 16\text{g} \\ \hline 30\text{g} \end{array}$$

$$D_{\text{H}_2} = \frac{2\text{g}}{22.4\text{L}}$$

$$D_{\text{Br}_2} =$$

Nov 1 - 9:04 AM