Volume Stoichiometry

* 22.4L is at STP $\left(\frac{1\,atm}{273.15k}\right)$

start$_A$ ⟶ mol ratio $mol_A \rightarrow mol_B$ ⟶ end$_B$

mass$_A$

vol_A (22.4L/mol)* (standard T and P)

P_1V_1 or $T \rightarrow mol_A$

$mol_A \rightarrow mol_B$

mass$_B$

vol_B (22.4L/mol)* (standard T and P)

$mol_B \rightarrow P_1V_1$ or T

Assign 6H

(4) $P = 0.82\,atm$

$V = \_\_\_\_\,L$

$n = 0.52\,mol$

$T = 283.58\,K$

V is the volume of the gas

$$\frac{PV}{P} = \frac{nRT}{P}$$

$$V = \frac{nRT}{P} \quad R = 0.0821\,\frac{L \cdot atm}{mol \cdot k}$$

$$V = \frac{0.52\,mol \cdot 0.0821\,\frac{L \cdot atm}{mol \cdot k} \cdot 283.58\,k}{0.82\,atm}$$

$$V = 14.76\,L$$

Assign 6H

(2) $P = 6.39\ atm$

$V = 21.82\ L$

$n = \_\_\_\_\ mol$

$T = 428.43\ K$

n is the # of mol of gas

$$\frac{PV}{RT} = \frac{nRT}{RT}$$

$$n = \frac{PV}{RT} \quad R = 0.0821 \frac{L \cdot atm}{mol \cdot K}$$

$$n = \frac{6.39\ atm \cdot 21.82\ L}{0.0821 \frac{L \cdot atm}{mol \cdot K} \cdot 428.43\ K}$$

$$n = 3.96\ mol$$

Calculating (2)

$$n = \frac{6.39\ atm \cdot 21.82\ L}{0.0821 \frac{L \cdot atm}{mol \cdot K} \cdot 428.43\ K}$$

Wrong way ~~[727.38]~~

6.39 [X] 21.82 [=]

[÷] 0.0821 [X] 428.43 [=]

Option 1 [3.96]

6.39 [X] 21.82 [=]

[÷] 0.0821 [÷] 428.43 [=]

Option 2 [3.96]

6.39 [X] 21.82 [=] [÷]

[(] 0.0821 [X] 428.43 [)]

[=]

Side 1 Example: $P_1V_1T \rightarrow n$ (step 1) $\quad n \rightarrow$ mass (step)

$n_{H_2} = \_\_\_ \text{ mol } H_2$

$P = 6.39 \text{ atm} \quad V = 21.82 \text{ L}$

$T = 428.43 \text{ K} \quad R = 0.0821 \frac{\text{L} \cdot \text{atm}}{\text{mol} \cdot \text{K}}$

$$1 = \frac{6.39 \text{ atm} \cdot 21.82 \text{ L}}{0.0821 \frac{\text{L} \cdot \text{atm}}{\text{mol} \cdot \text{K}} \cdot 428.43 \text{ K}}$$

$n = 3.96 \text{ mol } H_2$

$\text{Molar Mass}_{H_2} = 2.02 \text{ g/mol}$

$$\frac{\_\_\_ \text{ mol } H_2}{1 \text{ mol } H_2} \left| \frac{MM_{H_2} \text{ g}}{}\right.$$

$$\frac{3.96 \text{ mol } H_2}{1 \text{ mol } H_2} \left| \frac{2.02 \text{ g } H_2}{}\right.$$

$m_{H_2} = 8.00 \text{ g } H_2$