

Volume Stoichiometry

* 22.4L is at STP ($\frac{1 \text{ atm}}{273.15 \text{ K}}$)

Start_A $\xrightarrow{\text{mol ratio}} \text{end}_B$
 $\text{mol}_A \rightarrow \text{mol}_B$

Mass_A

Mass_B

Vol_A (22.4L/mol)*
 (Standard T and P)

mol_A $\rightarrow$ mol_B

Vol_B (22.4L/mol)*
 (Standard T and P)

P, V, or T $\rightarrow$ mol_A

mol_B $\rightarrow$ P, V, or T

Assign 6H

(4) $P = 0.82 \text{ atm}$

$V = \underline{\hspace{2cm}} \text{ L}$

$n = 0.52 \text{ mol}$

$T = 283.58 \text{ K}$

V is the volume of the gas

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

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

$$V = \frac{0.52 \text{ mol} \cdot 0.0821 \frac{\text{L} \cdot \text{atm}}{\text{mol} \cdot \text{K}} \cdot 283.58 \text{ K}}{0.82 \text{ atm}}$$

$$V = \underline{14.76 \text{ L}}$$

Assign 6H

$$(2) P = 6.39 \text{ atm}$$

$$V = 21.82 \text{ L}$$

$$n = \text{--- mol}$$

$$T = 428.43 \text{ K}$$

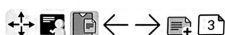
n is the # of mol of gas

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

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

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

$$n = 3.96 \text{ mol}$$



Calculating (2)

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

Option 1 [3.96]

$$6.39 \times 21.82 =$$

$$\div 0.0821 \div 428.43 =$$



JF

Wrong way

~~[727549.38]~~

$$6.39 \times 21.82 =$$

$$\div 0.0821 \times 428.43 =$$

option 2 [3.96]

$$6.39 \times 21.82 = \div$$

$$\div 0.0821 \times 428.43 =$$

$$=$$

Side Example: $P, V, T \rightarrow n$
(step 1)

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

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

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

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

$$n = 3.96 \text{ mol } H_2$$

$n \rightarrow \text{mass}$
(step)

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

--- mol H_2	MM H_2 g
	1 mol H_2
3.96 mol H_2	2.02 g H_2
	1 mol H_2

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