

Noteset 6A (Part 4) - In Class Noteset

Double Conversions with Molar Volume

Molar Volume

Volume (V) is the space occupied by an object in space



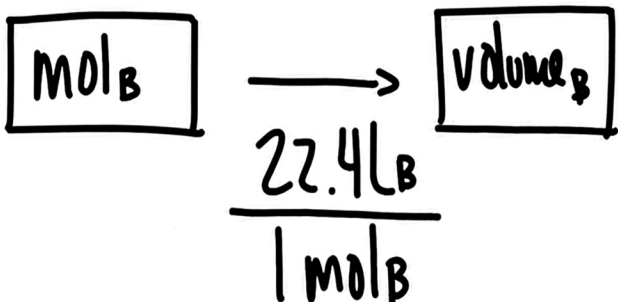
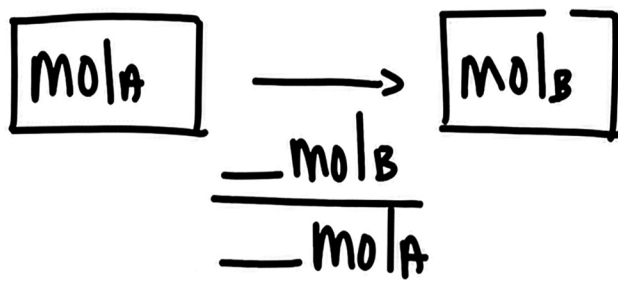
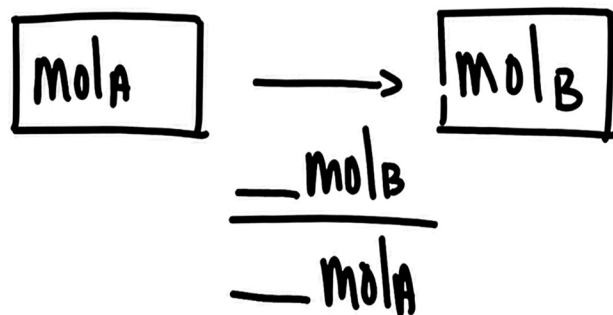
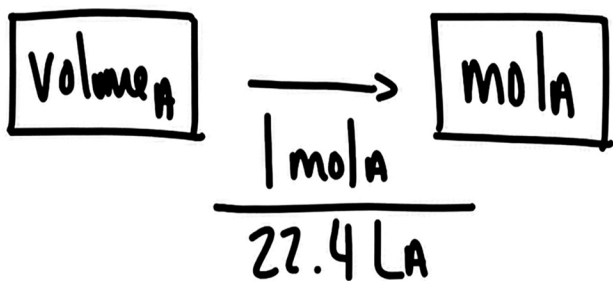
$$V_{\text{cube}} = l \cdot w \cdot h \text{ (cm}^3 = \text{mL)}$$

Molar Volume is the space occupied by 1 mol (6.022×10^{23} part) of a gas under normal conditions

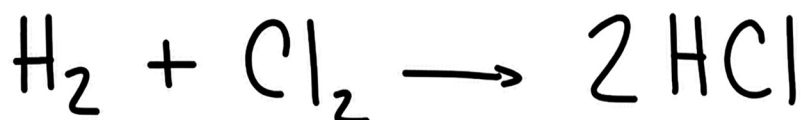
$$V_{\text{gas}} = \frac{22.4 \text{ L}}{1 \text{ mol}}$$

under standard conditions

Molar Volume Conversion Roadmap



Converting with Molar Volume $22.4 \text{ L}_A = 1 \text{ mol}_A$



Convert 39.2 L Cl_2 to mol HCl

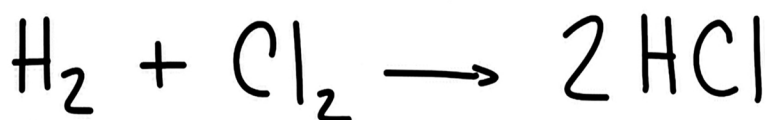
39.2 L Cl_2		1 mol Cl_2		1.75 mol Cl_2		2 mol HCl
<hr/>		22.4 L Cl_2		<hr/>		1 mol Cl_2
		$= 1.75 \text{ mol Cl}_2$				$= 3.50 \text{ mol HCl}$

Step 1

$V_{\text{Cl}_2} \rightarrow \text{mol Cl}_2$

Step 2

$\text{mol Cl}_2 \rightarrow \text{mol HCl}$



Convert 9.17 mol HCl to mol Cl_2

9.17 mol HCl		1 mol Cl_2		4.59 mol Cl_2		22.4 L Cl_2
<hr/>		2 mol HCl		<hr/>		1 mol Cl_2
		$= 4.59 \text{ mol Cl}_2$				$= 102.82 \text{ L Cl}_2$

Step 1

$\text{mol HCl} \rightarrow \text{mol Cl}_2$

Step 2

$\text{mol Cl}_2 \rightarrow \text{volume Cl}_2$