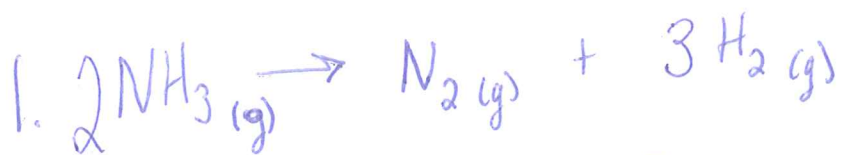


examples from class



a) Use 0.8 L NH<sub>3</sub> → ? L H<sub>2</sub> produced

$$\frac{0.8 \text{ L NH}_3}{2 \text{ L NH}_3} \left| \frac{3 \text{ L H}_2}{1 \text{ L NH}_3} \right. = \frac{(0.8 \times 3)}{2} = \boxed{1.2 \text{ L H}_2}$$

b) Use 0.8 L NH<sub>3</sub> → ? L of N<sub>2</sub> produced

$$\frac{0.8 \text{ L NH}_3}{2 \text{ L NH}_3} \left| \frac{1 \text{ L N}_2}{2 \text{ L NH}_3} \right. = \frac{0.8}{2} = \boxed{0.4 \text{ L N}_2}$$



a) If 1.4 L of H<sub>2</sub> produced → ? L Cl<sub>2</sub> produced

$$\frac{1.4 \text{ L H}_2}{1 \text{ L H}_2} \left| \frac{1 \text{ L Cl}_2}{1 \text{ L H}_2} \right. = \boxed{1.4 \text{ L Cl}_2}$$

Hard Problem!

L → mol → mass

b) If 1.4 L of H<sub>2</sub> produced → ? g of HCl used

$$\text{step \#1 L} = \frac{1.4 \text{ L H}_2}{1 \text{ L H}_2} \left| \frac{2 \text{ L HCl}}{1 \text{ L H}_2} \right. = \underline{2.8 \text{ L HCl}}$$

step #2 PV = nRT    P = 1 atm, V = —, n = # moles, R = 0.0821, T = 298 K

solve for n

$$\frac{(1 \times 2.8)}{(0.0821 \times 298)} = \frac{n \times 0.0821 \times 298}{0.0821 \times 298} \quad n = \underline{0.114 \text{ mol HCl}}$$

HCl ← H - 1 × 1.0  
           Cl - 1 × 35.5  
           36.5 g/mol.

step #3

$$\frac{0.114 \text{ mol HCl}}{1 \text{ mol HCl}} \left| \frac{36.5 \text{ g HCl}}{1 \text{ mol HCl}} \right. = \boxed{4.16 \text{ g HCl}}$$