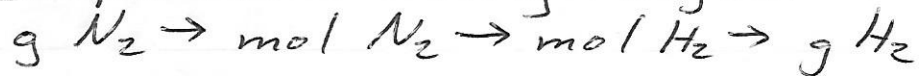


Step 1: Find limiting reagent



$$15.0\text{g N}_2 \times \frac{1 \text{ mol}}{28.02\text{g}} = 0.535 \text{ mol N}_2$$

$$0.535 \text{ mol N}_2 \times \frac{3 \text{ mol H}_2}{1 \text{ mol N}_2} = 1.605 \text{ mol H}_2$$

$$1.605 \text{ mol H}_2 \times \frac{2.02\text{g}}{1 \text{ mol}} = 3.24 \text{ g H}_2$$

→ H<sub>2</sub> is the limiting reagent

Step 2: Use H<sub>2</sub> to find the theoretical yield of NH<sub>3</sub>



$$2.5\text{g H}_2 \times \frac{1 \text{ mol}}{2.02\text{g}} = 1.24 \text{ mol H}_2$$

$$1.24 \text{ mol H}_2 \times \frac{2 \text{ mol NH}_3}{3 \text{ mol H}_2} = 0.83 \text{ mol NH}_3$$

$$0.83 \text{ mol NH}_3 \times \frac{17.04\text{g}}{1 \text{ mol}} = 14.14 \text{ g NH}_3 \leftarrow \text{theoretical yield}$$

Step 3:

$$\% \text{ yield NH}_3 = \frac{\text{actual yield}}{\text{theoretical yield}} \times 100\%$$

$$= \frac{10.5\text{g}}{14.14\text{g}} \times 100\%$$

$$= 74\%$$