

Calculate how many grams of acrylonitrile could be obtained from 651 kg of propylene, assuming there is excess NO present.

- 1 - Convert 651 kg propylene to moles. Use FORMULA WEIGHT (and kg->g conversion)
- 2 - Convert moles propylene to moles acrylonitrile using CHEMICAL EQUATION
- 3 - Convert moles acrylonitrile to mass. Use FORMULA WEIGHT

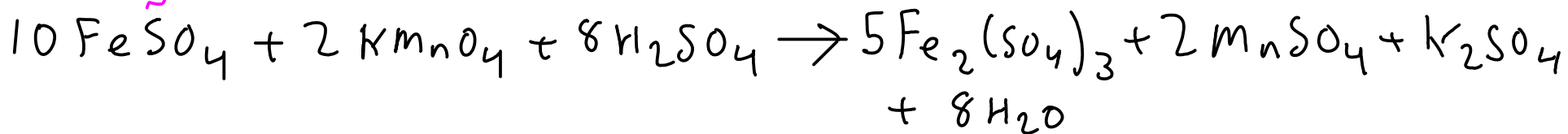
$$42.081 \text{ g C}_3\text{H}_6 = \text{mol C}_3\text{H}_6 \quad | \quad 4 \text{ mol C}_3\text{H}_6 = 4 \text{ mol C}_3\text{H}_3\text{N}$$

$$53.064 \text{ g C}_3\text{H}_3\text{N} = \text{mol C}_3\text{H}_3\text{N} \quad | \quad \text{kg} = 10^3 \text{ g}$$

$$\begin{aligned}
 & 651 \text{ kg C}_3\text{H}_6 \times \frac{10^3 \text{ g}}{\text{kg}} \times \frac{\text{mol C}_3\text{H}_6}{42.081 \text{ g C}_3\text{H}_6} \times \frac{4 \text{ mol C}_3\text{H}_3\text{N}}{4 \text{ mol C}_3\text{H}_6} \times \frac{53.064 \text{ g C}_3\text{H}_3\text{N}}{\text{mol C}_3\text{H}_3\text{N}} = \\
 & = \boxed{821000 \text{ g C}_3\text{H}_3\text{N}} \quad (821 \text{ kg})
 \end{aligned}$$

①
②
③

151.90 g/mol



How many mL of 0.250M potassium permanganate are needed to react with 3.36 g of iron(II) sulfate?

- 1 - Convert 3.36 g iron(II) sulfate to moles. Use FORMULA WEIGHT
- 2 - Convert moles iron(II) sulfate to moles potassium permanganate. Use CHEMICAL EQUATION
- 3 - Convert moles potassium permanganate to volume. Use MOLAR CONCENTRATION

$$151.90 \text{ g FeSO}_4 = 1 \text{ mol FeSO}_4 \quad | \quad 10 \text{ mol FeSO}_4 = 2 \text{ mol KMnO}_4$$

$$0.250 \text{ mol KMnO}_4 = 1 \text{ L} \quad | \quad \text{mL} = 10^{-3} \text{ L}$$

$$3.36 \text{ g FeSO}_4 \times \frac{1 \text{ mol FeSO}_4}{151.90 \text{ g FeSO}_4} \times \frac{2 \text{ mol KMnO}_4}{10 \text{ mol FeSO}_4} \times \frac{1 \text{ L}}{0.250 \text{ mol KMnO}_4} \times \frac{\text{mL}}{10^{-3} \text{ L}} =$$

①
②
③

$$= 17.7 \text{ mL of } 0.250 \text{ M KMnO}_4$$