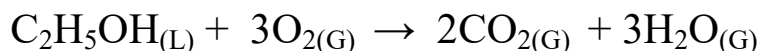


When 73.0 moles of ethanol combusts, how many moles of oxygen are consumed?

$$\text{MR} \quad \frac{\text{C}_2\text{H}_5\text{OH}}{\text{O}_2} \quad \frac{1}{3} = \frac{73.0}{X} \quad X = 219 \text{ moles O}_2$$

1



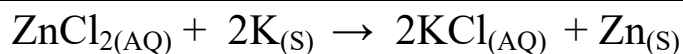
If  $1.75 \times 10^{24}$  molecules of ethanol combusts, how many liters of  $\text{CO}_{2(\text{G})}$  form?

$$\frac{1.75 \times 10^{24} \text{ molecules of ethanol}}{1} \times \frac{1 \text{ mole ethanol}}{6.02 \times 10^{23} \text{ molecules of ethanol}} = \begin{matrix} X = 0.291 \times 10^1 \text{ moles} \\ X = 2.91 \text{ moles ethanol} \end{matrix}$$

2

$$\text{MR} \quad \frac{\text{C}_2\text{H}_5\text{OH}}{\text{CO}_2} \quad \frac{1}{2} = \frac{2.91}{X} \quad X = 5.82 \text{ moles CO}_2$$

$$\frac{5.82 \text{ moles CO}_2}{1} \times \frac{22.4 \text{ L CO}_2}{1 \text{ mole CO}_2} = 130. \text{ Liters CO}_2 \quad 3 \text{ SF}$$

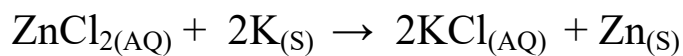


When 33.3 moles of potassium react, how many grams of zinc will be produced?

$$\text{MR} \quad \frac{\text{K}}{\text{Zn}} \quad \frac{2}{1} = \frac{33.3}{X} \quad \begin{array}{l} 2X = 33.3 \\ X = 16.7 \text{ moles Zn} \end{array}$$

3

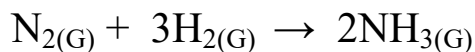
$$\frac{16.7 \text{ moles Zn}}{1} \times \frac{65 \text{ g Zn}}{1 \text{ mole Zn}} = 1090 \text{ g Zn} \quad 3 \text{ SF}$$



When 12.43 moles of zinc chloride react, how many moles of KCl will form?

$$\text{MR} \quad \frac{\text{ZnCl}_2}{\text{KCl}} \quad \frac{1}{2} = \frac{12.43}{X} \quad X = 24.86 \text{ moles KCl}$$

4



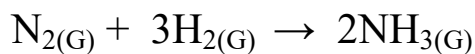
When 358 liters of hydrogen react, how many grams of ammonia will form?

$$\frac{358 \text{ Liters H}_2}{1} \times \frac{1 \text{ mole H}_2}{22.4 \text{ Liters H}_2} = 16.0 \text{ moles H}_2 \quad 3 \text{ SF}$$

5

$$\text{MR} \quad \frac{\text{H}_2}{\text{NH}_3} \quad \frac{3}{2} = \frac{16.0}{X} \quad \begin{array}{l} 3X = 32.0 \\ X = 10.7 \text{ moles NH}_3 \end{array}$$

$$\frac{10.7 \text{ moles NH}_3}{1} \times \frac{17 \text{ grams NH}_3}{1 \text{ moles NH}_3} = 182 \text{ grams NH}_3 \quad 3 \text{ SF}$$



When 0.456 moles of nitrogen react, how many molecules of ammonia form?

$$\text{MR} \quad \frac{\text{N}_2}{\text{NH}_3} \quad \frac{1}{2} = \frac{0.456}{X} \quad X = 0.912 \text{ moles NH}_3 \quad 3 \text{ SF}$$

6

$$\frac{0.912 \text{ moles NH}_3}{1} \times \frac{6.02 \times 10^{23} \text{ molecules of H}_2}{1 \text{ mole NH}_3} = 5.49 \times 10^{23} \text{ molecules of NH}_3$$