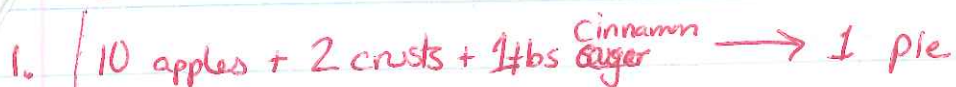


Stoichiometry



$$25 \text{ pies} \times \frac{10 \text{ apples}}{1 \text{ pie}} = 250 \text{ pies}$$



$$12 \text{ mole KClO}_3 \times \frac{3 \text{ mol O}_2}{2 \text{ mol KClO}_3} = 18 \text{ mol O}_2$$

3. $14 \text{ mol KClO}_3 \times \frac{3 \text{ mol O}_2}{2 \text{ mol KClO}_3} = 21 \text{ mol O}_2$



$$2.0 \times 10^{23} \text{ molecules O}_2 \times \frac{2 \text{ molec. H}_2\text{O}}{1 \text{ molec. O}_2} = 4.0 \times 10^{23} \text{ molecules H}_2\text{O}$$

$$22.5 \text{ moles O}_2 \times \frac{2 \text{ mol H}_2\text{O}}{1 \text{ mol O}_2} = 45.0 \text{ mol H}_2\text{O}$$

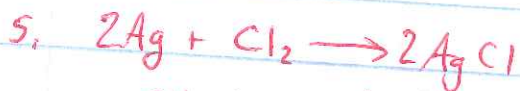
Section 12.2

1. $10 \text{ mol H}_2 \times \frac{2 \text{ mol HCl}}{1 \text{ mol H}_2} = 20 \text{ mol HCl}$

2. $14 \text{ mol FeCl}_3 \times \frac{3 \text{ mol Cl}_2}{2 \text{ mol FeCl}_3} = 21 \text{ mol Cl}_2$

3. $4 \text{ mol NO} \times \frac{2 \text{ mol NO}_2}{2 \text{ mol NO}} \times \frac{46.0 \text{ g NO}_2}{1 \text{ mol NO}_2} = 184 \text{ g NO}_2$

4. $75.0 \text{ g KClO}_3 \times \frac{1 \text{ mol KClO}_3}{122.6 \text{ g KClO}_3} \times \frac{3 \text{ mol O}_2}{2 \text{ mol KClO}_3} \times \frac{32.0 \text{ g O}_2}{1 \text{ mol O}_2} = 29.4 \text{ g O}_2$

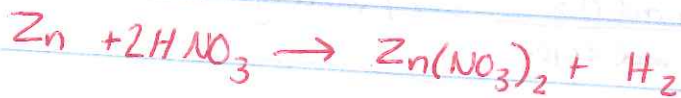


$$84 \text{ g AgCl} \times \frac{1 \text{ mol AgCl}}{143.4 \text{ g AgCl}} \times \frac{2 \text{ mol Ag}}{2 \text{ mol AgCl}} \times \frac{107.9 \text{ g Ag}}{1 \text{ mol Ag}} = \boxed{63.2 \text{ g Ag}}$$

$$6. \quad 4.80 \text{ g O}_2 \times \frac{1 \text{ mol O}_2}{32.0 \text{ g O}_2} \times \frac{2 \text{ mol CO}}{1 \text{ mol O}_2} \times \frac{22.4 \text{ L CO}}{1 \text{ mol CO}} = \boxed{6.72 \text{ L CO}}$$

$$7. \quad 15.0 \text{ L N}_2\text{O}_3 \times \frac{1 \text{ mol N}_2\text{O}_3}{22.4 \text{ L N}_2\text{O}_3} \times \frac{3 \text{ mol O}_2}{2 \text{ mol N}_2\text{O}_3} \times \frac{22.4 \text{ L}}{1 \text{ mol O}_2} = \boxed{22.5 \text{ L O}_2}$$

$$8. \quad 7.5 \text{ L H}_2 \times \frac{1 \text{ mol H}_2}{22.4 \text{ L H}_2} \times \frac{1 \text{ mol Zn}}{1 \text{ mol H}_2} \times \frac{65.4 \text{ g Zn}}{1 \text{ mol Zn}} = \boxed{21.9 \text{ g Zn}}$$



Section
12.3



$$\text{LR} = \text{O}_2 \rightarrow 4 \text{ mol O}_2 \times \frac{2 \text{ mol H}_2\text{O}}{1 \text{ mol O}_2} = \boxed{8 \text{ mol H}_2\text{O}}$$

$$16 \text{ mol H}_2 \times \frac{2 \text{ mol H}_2\text{O}}{2 \text{ mol H}_2} = 16 \text{ mol H}_2\text{O}$$

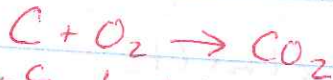
$$2. \quad 24.0 \text{ g H}_2 \times \frac{1 \text{ mol H}_2}{2.0 \text{ g H}_2} \times \frac{2 \text{ mol H}_2\text{O}}{2 \text{ mol H}_2} \times \frac{18.0 \text{ g H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = 216 \text{ g H}_2\text{O}$$

$$160.0 \text{ g O}_2 \times \frac{1 \text{ mol O}_2}{32.0 \text{ g O}_2} \times \frac{2 \text{ mol H}_2\text{O}}{1 \text{ mol O}_2} \times \frac{18.0 \text{ g H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = \boxed{180 \text{ g H}_2\text{O}}$$

LR = O₂

$$\text{mass excess: } 160 \text{ g O}_2 \times \frac{1 \text{ mol O}_2}{32.0 \text{ g O}_2} \times \frac{2 \text{ mol H}_2}{1 \text{ mol O}_2} \times \frac{2.0 \text{ g H}_2}{1 \text{ mol H}_2} = 20.0 \text{ g used}$$

$$24.0 \text{ g} - 20.0 \text{ g} = 4.0 \text{ g H}_2 \text{ remain}$$



$$3. \quad 18.0 \text{ g C} \times \frac{1 \text{ mol C}}{12.0 \text{ g C}} \times \frac{1 \text{ mol CO}_2}{1 \text{ mol C}} \times \frac{44.0 \text{ g CO}_2}{1 \text{ mol CO}_2} = \boxed{66.0 \text{ g CO}_2}$$

$$\% \text{ yield} = \frac{55.0 \text{ g}}{66.0 \text{ g}} \times 100 = \boxed{83.3\%}$$



$$25.8 \text{ g HCl} \times \frac{1 \text{ mol HCl}}{36.5 \text{ g HCl}} \times \frac{1 \text{ mol Cl}_2}{2 \text{ mol HCl}} \times \frac{71.0 \text{ g Cl}_2}{1 \text{ mol Cl}_2} = \boxed{25.1 \text{ g Cl}_2}$$

$$\% \text{ yield} = \frac{13.6 \text{ g Cl}_2}{25.1 \text{ g Cl}_2} \times 100 = \boxed{54.2\%}$$

$$5. \quad 100.0 \text{ g AgCl} \times \frac{1 \text{ mol AgCl}}{143.4 \text{ g AgCl}} \times \frac{2 \text{ mol Ag}}{2 \text{ mol AgCl}} \times \frac{107.9 \text{ g Ag}}{1 \text{ mol Ag}} = 75.2 \text{ g Ag} \times 0.946 = \boxed{71.2 \text{ g Ag}}$$

$$6. \quad 42.8 \text{ g Mg} \times \frac{1 \text{ mol Mg}}{24.3 \text{ g Mg}} \times \frac{2 \text{ mol MgO}}{2 \text{ mol Mg}} \times \frac{40.3 \text{ g MgO}}{1 \text{ mol MgO}} = 71.0 \text{ g MgO} \times 0.817 = \boxed{58.0 \text{ g MgO}}$$