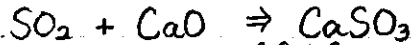
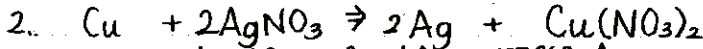


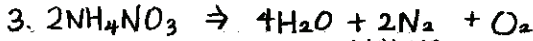
Sheet #5



$$1200 \text{ t coal} \times \frac{2.8 \text{ t S}}{100 \text{ t coal}} \times \frac{1000000 \text{ g S}}{1 \text{ t S}} \times \frac{1 \text{ mol S}}{32.066 \text{ g S}} \times \frac{1 \text{ mol SO}_2}{1 \text{ mol S}} \times \frac{1 \text{ mol CaSO}_3}{1 \text{ mol SO}_2} \times \frac{120.141 \text{ g CaSO}_3}{1 \text{ mol CaSO}_3} \times \frac{1 \text{ t CaSO}_3}{1000000 \text{ g CaSO}_3} = 125.8884 \text{ t CaSO}_3$$



$$158 \text{ g Cu} \times \frac{1 \text{ mol Cu}}{63.546 \text{ g Cu}} \times \frac{2 \text{ mol Ag}}{1 \text{ mol Cu}} \times \frac{107.868 \text{ g Ag}}{1 \text{ mol Ag}} = 536.403 \text{ g Ag}$$



$$12.0 \text{ g } NH_4NO_3 \times \frac{1 \text{ mol } NH_4NO_3}{80.06 \text{ g } NH_4NO_3} \times \frac{7 \text{ mol } (H_2O + N_2 + O_2 = \text{gas})}{2 \text{ mol } NH_4NO_3} = 0.525 \text{ mol gas}$$

$$P = 745 \text{ torr} \times \frac{101.325 \text{ kPa}}{760 \text{ torr}} = 99.325 \text{ kPa}$$

$$V = ?$$

$$V = \frac{nRT}{P}$$

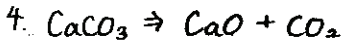
$$= \frac{0.525 \text{ mol gas} \times 8.314 \frac{\text{kPa} \cdot \text{L}}{\text{mol} \cdot \text{K}} \times 800.15 \text{ K}}{99.325 \text{ kPa}}$$

$$n = 0.525 \text{ mol gas}$$

$$R = 8.314 \frac{\text{kPa} \cdot \text{L}}{\text{mol} \cdot \text{K}}$$

$$= 35.1 \text{ L gas}$$

$$T = 527^\circ\text{C} + 273.15 = 800.15 \text{ K}$$



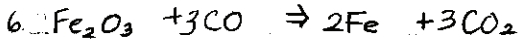
$$200 \text{ g } CO_2 \times \frac{1 \text{ mol } CO_2}{44.009 \text{ g } CO_2} \times \frac{1 \text{ mol } CaCO_3}{1 \text{ mol } CO_2} \times \frac{100.086 \text{ g } CaCO_3}{1 \text{ mol } CaCO_3} = 454.8433 \text{ g } CaCO_3$$

$$\% \text{ of } CaCO_3 \text{ in original} = \frac{454.8433 \text{ g } CaCO_3}{500 \text{ g original}} \times 100\% = 90.97\%$$

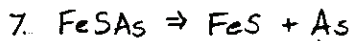
$$\begin{aligned} \text{mass } CO_2 &= \text{MASS ORIGINAL} - \text{MASS RESIDUE} \\ &= 500 \text{ g} - 300 \text{ g} \\ &= 200 \text{ g } CO_2! \end{aligned}$$



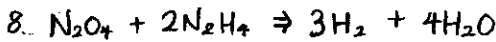
$$50.0 \text{ g } Na_2CO_3 \times \frac{60\% \text{ } Na_2CO_3}{100\% \text{ } Na_2CO_3} \times \frac{1 \text{ mol } Na_2CO_3}{105.99 \text{ g } Na_2CO_3} \times \frac{1 \text{ mol } CO_2}{1 \text{ mol } Na_2CO_3} \times \frac{44.01 \text{ g } CO_2}{1 \text{ mol } CO_2} = 12.5 \text{ g } CO_2$$



$$1.00 \text{ t } Fe_2O_3 \times \frac{1000000 \text{ g } Fe_2O_3}{1.00 \text{ t } Fe_2O_3} \times \frac{1 \text{ mol } Fe_2O_3}{159.69 \text{ g } Fe_2O_3} \times \frac{2 \text{ mol } Fe}{1 \text{ mol } Fe_2O_3} \times \frac{55.85 \text{ g } Fe}{1 \text{ mol } Fe} \times \frac{1 \text{ kg } Fe}{1000 \text{ g } Fe} = 699.5 \text{ kg } Fe$$



$$1 \text{ kg } As \times \frac{1000 \text{ g } As}{1 \text{ kg } As} \times \frac{1 \text{ mol } As}{74.922 \text{ g } As} \times \frac{1 \text{ mol } FeSAs}{1 \text{ mol } As} \times \frac{162.833 \text{ g } FeSAs}{1 \text{ mol } FeSAs} \times \frac{1 \text{ kg } FeSAs}{1000 \text{ g } FeSAs} = 2.173 \text{ kg } FeSAs$$



$$25.0 \text{ t } N_2O_4 \times \frac{1000000 \text{ g } N_2O_4}{1 \text{ t } N_2O_4} \times \frac{1 \text{ mol } N_2O_4}{92.01 \text{ g } N_2O_4} \times \frac{2 \text{ mol } N_2H_4}{1 \text{ mol } N_2O_4} \times \frac{32.046 \text{ g } N_2H_4}{1 \text{ mol } N_2H_4} \times \frac{1 \text{ t } N_2H_4}{1000000 \text{ g } N_2H_4} = 17.4144 \text{ t } N_2H_4$$