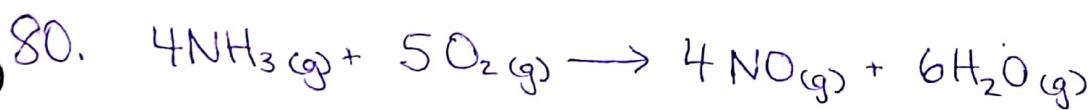


Unit 6 - p. 117 #80, 82



a) $2.00\text{g NH}_3 \times \frac{1\text{mol NH}_3}{17.0\text{g NH}_3} \times \frac{4\text{mol NO}}{4\text{mol NH}_3} = 0.118\text{ mol NO}$

$$2.50\text{g O}_2 \times \frac{1\text{mol O}_2}{32.0\text{g O}_2} \times \frac{4\text{mol NO}}{5\text{mol O}_2} = 0.0625\text{ mol NO}$$

Limiting reactant = O₂

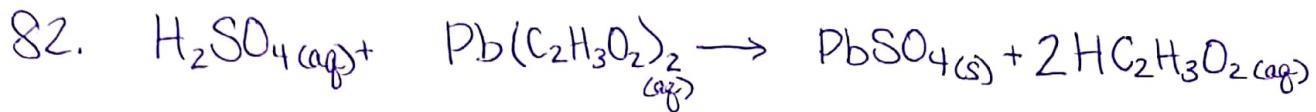
b) $0.0625\text{ mol NO} \times \frac{30.0\text{g NO}}{1\text{mol NO}} = \boxed{1.88\text{ g NO}}$

$$0.0625\text{ mol NO} \times \frac{6\text{ mol H}_2\text{O}}{4\text{ mol NO}} \times \frac{18.0\text{g H}_2\text{O}}{1\text{mol H}_2\text{O}} = \boxed{1.69\text{ g H}_2\text{O}}$$

c) $0.118 - 0.0625 = 0.056\text{ mol NO}$

$$0.056\text{ mol NO} \times \frac{4\text{ mol NH}_3}{4\text{ mol NO}} \times \frac{17.0\text{g NH}_3}{1\text{mol NH}_3} = \boxed{0.94\text{ g NH}_3}$$

d) $\begin{array}{rcl} \text{start} & & \\ 2.00 + 2.50 & = & 1.69 + \cancel{1.88} + 0.94 \\ 4.50 & = & 4.51 \checkmark & \begin{array}{l} \text{left over} \\ \text{reactant!} \end{array} \end{array}$



$$5.00\text{g } H_2SO_4 \times \frac{1\text{ mol } H_2SO_4}{98.1\text{g } H_2SO_4} \times \frac{1\text{ mol } PbSO_4}{1\text{ mol } H_2SO_4} \times \frac{303.3\text{g } PbSO_4}{1\text{ mol } PbSO_4} = 15.5\text{g } PbSO_4$$

$$5.00\text{g } Pb(C_2H_3O_2)_2 \times \frac{1\text{ mol } Pb(C_2H_3O_2)_2}{325.3\text{g } Pb(C_2H_3O_2)_2} \times \frac{1\text{ mol } PbSO_4}{1\text{ mol } Pb(C_2H_3O_2)_2} \times \frac{303.3\text{g } PbSO_4}{1\text{ mol } PbSO_4} = \boxed{4.66\text{g } PbSO_4}$$



$$15.5\text{g } PbSO_4 - 4.66\text{g} = 10.84\text{g } PbSO_4$$

$$10.84\text{g } PbSO_4 \times \frac{1\text{ mol } PbSO_4}{303.3\text{g } PbSO_4} \times \frac{1\text{ mol } H_2SO_4}{1\text{ mol } PbSO_4} \times \frac{98.1\text{g } H_2SO_4}{1\text{ mol } H_2SO_4} = \boxed{3.51\text{g } H_2SO_4}$$

$$5.00\text{g } Pb(C_2H_3O_2)_2 \times \frac{1\text{ mol } Pb(C_2H_3O_2)_2}{325.3\text{g } Pb(C_2H_3O_2)_2} \times \frac{2\text{ mol } H_2C_2H_3O_2}{1\text{ mol } Pb(C_2H_3O_2)_2} \times \frac{60.0\text{g } H_2C_2H_3O_2}{1\text{ mol } H_2C_2H_3O_2} = \boxed{1.84\text{g } H_2C_2H_3O_2}$$