

Stoichiometry (Mole - Mass Problems) Key

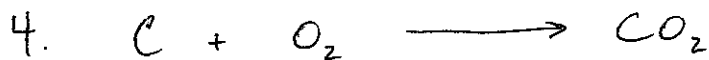
$$1.a) \frac{40.7 \text{ g KClO}_3}{122.6 \text{ g KClO}_3} \left| \frac{1 \text{ mol KClO}_3}{2 \text{ mol KClO}_3} \right| \frac{3 \text{ mol O}_2}{2 \text{ mol KClO}_3} = \boxed{0.498 \text{ mol O}_2}$$

$$b) \frac{1.5 \text{ mol KCl}}{2 \text{ mol KCl}} \left| \frac{2 \text{ mol KClO}_3}{2 \text{ mol KCl}} \right| \frac{122.6 \text{ g KClO}_3}{1 \text{ mol KClO}_3} = \boxed{1.8 \times 10^2 \text{ g KClO}_3}$$

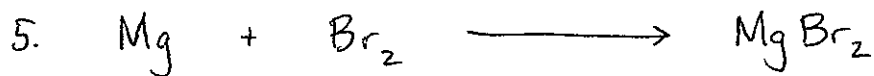
$$2.a) \frac{18.0 \text{ g Al}}{27.0 \text{ g Al}} \left| \frac{1 \text{ mol Al}}{2 \text{ mol Al}} \right| \frac{3 \text{ mol H}_2}{2 \text{ mol Al}} = \boxed{1.00 \text{ mol H}_2}$$

$$b) \frac{3.0 \text{ mol HCl}}{6 \text{ mol HCl}} \left| \frac{2 \text{ mol AlCl}_3}{6 \text{ mol HCl}} \right| \frac{133.5 \text{ g AlCl}_3}{1 \text{ mol AlCl}_3} = \boxed{1.3 \times 10^2 \text{ g AlCl}_3}$$

$$3. \frac{5.6 \text{ g HF}}{20.0 \text{ g HF}} \left| \frac{1 \text{ mol HF}}{2 \text{ mol HF}} \right| \frac{1 \text{ mol F}_2}{2 \text{ mol HF}} = \boxed{0.14 \text{ mol F}_2}$$



$$\frac{0.25 \text{ mol O}_2}{1 \text{ mol O}_2} \left| \frac{1 \text{ mol C}}{1 \text{ mol O}_2} \right| \frac{12.0 \text{ g C}}{1 \text{ mol C}} = \boxed{3.0 \text{ g C}}$$

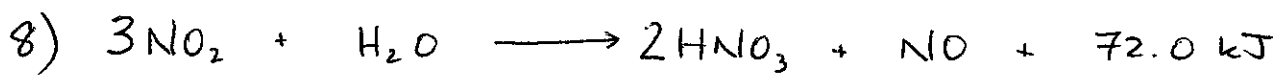


$$\frac{1.82 \text{ g Br}_2}{159.8 \text{ g Br}_2} \left| \frac{1 \text{ mol Br}_2}{1 \text{ mol Br}_2} \right| \frac{1 \text{ mol Mg}}{1 \text{ mol Br}_2} = \boxed{0.0101 \text{ mol Mg}}$$
$$= \boxed{1.01 \times 10^{-2} \text{ mol Mg}}$$

$$6. \frac{2.4 \text{ mol SO}_3}{2 \text{ mol SO}_3} \left| \frac{1 \text{ mol O}_2}{2 \text{ mol SO}_3} \right| \frac{32.0 \text{ g O}_2}{1 \text{ mol O}_2} = \boxed{38 \text{ g O}_2}$$



$$\frac{0.75 \text{ mol C}_5\text{H}_{12}}{1 \text{ mol C}_5\text{H}_{12}} \left| \frac{8 \text{ mol O}_2}{1 \text{ mol C}_5\text{H}_{12}} \right| \frac{32.0 \text{ g O}_2}{1 \text{ mol O}_2} = \boxed{1.9 \times 10^2 \text{ g O}_2}$$



$$\frac{50.0 \text{ g NO}_2}{46.0 \text{ g NO}_2} \left| \frac{1 \text{ mol NO}_2}{3 \text{ mol NO}_2} \right| \frac{2 \text{ mol HNO}_3}{3 \text{ mol NO}_2} = \boxed{0.725 \text{ mol HNO}_3}$$

$$9) \quad \frac{5.00 \text{ mol C}_2\text{H}_5\text{OH}}{2 \text{ mol C}_2\text{H}_5\text{OH}} \left| \frac{1 \text{ mol C}_6\text{H}_{12}\text{O}_6}{2 \text{ mol C}_2\text{H}_5\text{OH}} \right| \frac{180.0 \text{ g C}_6\text{H}_{12}\text{O}_6}{1 \text{ mol C}_6\text{H}_{12}\text{O}_6} = \boxed{4.50 \times 10^2 \text{ g C}_6\text{H}_{12}\text{O}_6}$$



$$\frac{260.0 \text{ g octane}}{114 \text{ g octane}} \left| \frac{1 \text{ mol octane}}{2 \text{ mol octane}} \right| \frac{16 \text{ mol CO}_2}{2 \text{ mol octane}} = \boxed{18.25 \text{ mol CO}_2}$$