

5. Given: $\underline{\hspace{1cm}}$ $\text{C}_5\text{H}_{12}(\text{l}) + \underline{8} \text{O}_2(\text{g}) \rightarrow \underline{5} \text{CO}_2(\text{g}) + \underline{6} \text{H}_2\text{O}(\text{g})$ Calculate the grams of $\text{O}_2(\text{g})$ gas needed to react with 2.00 mol of C_5H_{12} ?

$$2.00 \text{ mol C}_5\text{H}_{12} \times \frac{8 \text{ mol O}_2}{1 \text{ mol C}_5\text{H}_{12}} \times \frac{32.00 \text{ g}}{1 \text{ mol O}_2} = 512 \text{ g O}_2$$

6. Given: $\underline{2} \text{N}_2(\text{g}) + \underline{5} \text{O}_2(\text{g}) \rightarrow \underline{2} \text{N}_2\text{O}_5(\text{g})$ How many moles of $\text{O}_2(\text{g})$ are needed to react with 1.250 moles of $\text{N}_2(\text{g})$.

$$1.250 \text{ mol N}_2 \times \frac{5 \text{ mol O}_2}{2 \text{ mol N}_2} = 3.125 \text{ mol O}_2$$

7. How many moles of MgCl_2 can be produced from 16.2 moles of HCl based on the following reaction?



$$16.2 \text{ mol HCl} \times \frac{1 \text{ mol MgCl}_2}{2 \text{ mol HCl}} = 8.10 \text{ mol MgCl}_2$$

8. How many moles of Al would be required to produce 18.0 mol of H_2 according to the following unbalanced equation?



$$18.0 \text{ mol H}_2 \times \frac{2 \text{ mol Al}}{3 \text{ mol H}_2} = 12.0 \text{ mol Al}$$

9. Consider the reaction: $\underline{\hspace{1cm}} \text{S}(\text{s}) + \underline{2} \text{H}_2\text{SO}_4(\text{aq}) \rightarrow \underline{3} \text{SO}_2(\text{g}) + \underline{2} \text{H}_2\text{O}(\text{l})$

4.80 g of sulfur reacts with excess sulfuric acid, what mass of water will be produced?

$$4.80 \text{ g S} \times \frac{1 \text{ mol S}}{32.07 \text{ g}} \times \frac{2 \text{ mol H}_2\text{O}}{1 \text{ mol S}} \times \frac{18.02 \text{ g}}{1 \text{ mol H}_2\text{O}} = 5.39 \text{ g H}_2\text{O}$$