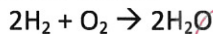


Review worksheet chapter 11

1. How many moles of water are produced from 6.5 moles of oxygen according to the following reaction? (10 points)



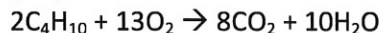
$$6.5 \text{ mol O}_2 \times \frac{2 \text{ mol H}_2\text{O}}{1 \text{ mol O}_2} = 13.0 \text{ mol H}_2\text{O}$$

2. How many moles of Fe are needed to react with 3.2 moles of S to form FeS? (hint you need the balanced equation) (15 points)



$$3.2 \text{ mol S} \times \frac{2 \text{ mol Fe}}{3 \text{ mol S}} = 2.13 \text{ mol Fe}$$

3. How many grams of CO₂ are produced when 0.85g of C₄H₁₀ reacts with oxygen according to the following equation:



$$0.85 \text{ g C}_4\text{H}_{10} \times \frac{1 \text{ mol C}_4\text{H}_{10}}{58.0 \text{ g C}_4\text{H}_{10}} \times \frac{8 \text{ mol CO}_2}{2 \text{ mol C}_4\text{H}_{10}} \times \frac{44.0 \text{ g CO}_2}{1 \text{ mol CO}_2} = 2.58 \text{ g CO}_2$$

4. What mass of CO must react with O₂ to produce 0.69g of CO₂? (15 points)



$$0.69 \text{ g CO}_2 \times \frac{1 \text{ mol CO}_2}{44.0 \text{ g}} \times \frac{2 \text{ mol CO}}{2 \text{ mol CO}_2} \times \frac{28.0 \text{ g CO}}{1 \text{ mol CO}} = 0.44 \text{ g CO}$$

5. What mass of SO₃ is produced from the reaction between 31.5g of S₈ and 8.65 g of O₂?



$$31.5 \text{ g S}_8 \times \frac{1 \text{ mol S}_8}{256.8 \text{ g S}_8} \times \frac{8 \text{ mol SO}_3}{1 \text{ mol S}_8} \times \frac{80.1 \text{ g SO}_3}{1 \text{ mol SO}_3} = 78.6 \text{ g SO}_3$$

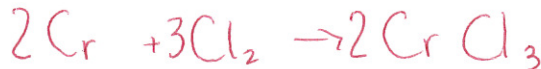
What is the limiting reactant?

O₂

$$8.65 \text{ g O}_2 \times \frac{1 \text{ mol O}_2}{32.0 \text{ g O}_2} \times \frac{8 \text{ mol SO}_3}{12 \text{ mol O}_2} \times \frac{80.1 \text{ g SO}_3}{1 \text{ mol SO}_3} = 14.4 \text{ g SO}_3$$

6. A reaction occurs between Cr and Cl₂ to form CrCl₃

a. Write the equation



- b. If 5.6 g of Cr and 4.5g of Cl₂ are used, how much CrCl₃ will be produced?

$$5.6 \text{ g Cr} \times \frac{1 \text{ mol Cr}}{52.0 \text{ g Cr}} \times \frac{2 \text{ mol CrCl}_3}{2 \text{ mol Cr}} \times \frac{158.5 \text{ g CrCl}_3}{1 \text{ mol CrCl}_3} = 17.1 \text{ g CrCl}_3$$

$$4.5 \text{ g Cl}_2 \times \frac{1 \text{ mol Cl}_2}{71.0 \text{ g}} \times \frac{2 \text{ mol CrCl}_3}{3 \text{ mol Cl}_2} \times \frac{158.5 \text{ g CrCl}_3}{1 \text{ mol CrCl}_3} = 6.70 \text{ g CrCl}_3$$

- c. A student performs the experiment and gets 5.43g. What is the percent yield?

$$\frac{5.43 \text{ g}}{6.70 \text{ g}} \times 100 = 81.0 \%$$