

# Extra Practice for Quiz!

(Not required - just extra)

## Stoichiometry Practice: Mixed Conversions

1) Translate: Aluminum is added to a copper (I) chloride solution, aluminum chloride and copper are produced.



A) 3.5 grams of aluminum would result in how many grams of copper being produced?

$$3.5 \text{ g Al} \times \frac{1 \text{ mol Al}}{26.98 \text{ g Al}} \times \frac{3 \text{ mol Cu}}{1 \text{ mol Al}} \times \frac{63.55 \text{ g Cu}}{1 \text{ mol Cu}} = \boxed{25 \text{ g Cu}}$$

B) If 1.25 moles of aluminum chloride were produced, how many grams of copper (I) chloride solution were required?

$$1.25 \text{ mol AlCl}_3 \times \frac{3 \text{ mol CuCl}}{1 \text{ mol AlCl}_3} \times \frac{99 \text{ g CuCl}}{1 \text{ mol CuCl}} = \boxed{371 \text{ g CuCl}}$$

2) Translate: Magnesium ribbon reacts with oxygen to produce magnesium oxide.



A) If 3.5 grams of Magnesium ribbon were used, how many moles of magnesium oxide were produced?

$$3.5 \text{ g Mg} \times \frac{1 \text{ mol Mg}}{24.31 \text{ g Mg}} \times \frac{2 \text{ mol MgO}}{2 \text{ mol Mg}} = \boxed{0.14 \text{ mol MgO}}$$

B) Assuming 0.35 moles of magnesium oxide were produced, how many moles of Oxygen were required?

$$0.35 \text{ mol MgO} \times \frac{1 \text{ mol O}_2}{2 \text{ mol MgO}} = \boxed{0.18 \text{ mol O}_2}$$

3) Translate: Potassium Chloride and Sodium Carbonate react in a double replacement reaction.



A) 5.5 grams of potassium chloride are used, how many moles of potassium carbonate is created?

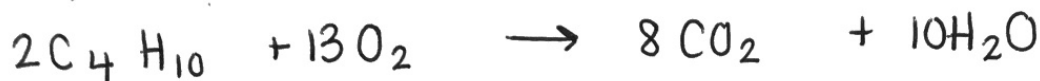
$$5.5 \text{ g KCl} \times \frac{1 \text{ mol KCl}}{74.55 \text{ g KCl}} \times \frac{1 \text{ mol K}_2\text{CO}_3}{2 \text{ mol KCl}} = \boxed{0.037 \text{ mol K}_2\text{CO}_3}$$

B) If 18 grams of sodium chloride are produced, how many grams of sodium carbonate were required?

$$18 \text{ g NaCl} \times \frac{1 \text{ mol NaCl}}{58.44 \text{ g NaCl}} \times \frac{1 \text{ mol Na}_2\text{CO}_3}{2 \text{ mol NaCl}} \times \frac{105.99 \text{ g Na}_2\text{CO}_3}{1 \text{ mol Na}_2\text{CO}_3} = \boxed{16 \text{ g Na}_2\text{CO}_3}$$

(Butane)

4) The complete combustion of tetracarbon decahydride in oxygen.



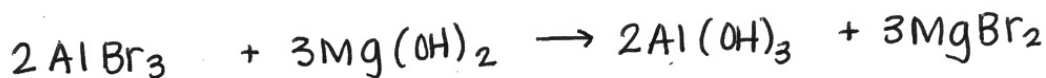
A) 6.0 moles of oxygen will produce how many moles of each of the products?

$$6.0 \text{ mol } O_2 \times \frac{8 \text{ mol } CO_2}{13 \text{ mol } O_2} = \boxed{3.7 \text{ mol } CO_2} \quad 6.0 \text{ mol } O_2 \times \frac{10 \text{ mol } H_2O}{13 \text{ mol } O_2} = \boxed{4.6 \text{ mol } H_2O}$$

B) 135.0 grams of tetracarbon decahydride will produce how many moles of carbon dioxide

$$135.0 \text{ g } C_4H_{10} \times \frac{1 \text{ mol } C_4H_{10}}{58.14 \text{ g } C_4H_{10}} \times \frac{8 \text{ mol } CO_2}{2 \text{ mol } C_4H_{10}} = \boxed{9.288 \text{ mol } CO_2}$$

5) The reaction of  $AlBr_3$  with  $Mg(OH)_2$



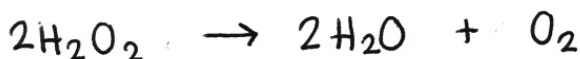
A) 1.05 moles of aluminum bromide produces how many moles of magnesium bromide

$$1.05 \text{ mol } AlBr_3 \times \frac{3 \text{ mol } MgBr_2}{2 \text{ mol } AlBr_3} = \boxed{1.58 \text{ mol } MgBr_2}$$

B) 2.75 moles of magnesium hydroxide would yield how many grams of aluminum hydroxide

$$2.75 \text{ mol } Mg(OH)_2 \times \frac{2 \text{ mol } Al(OH)_3}{3 \text{ mol } Mg(OH)_2} \times \frac{78.01 \text{ g } Al(OH)_3}{1 \text{ mol } Al(OH)_3} = \boxed{143 \text{ g } Al(OH)_3}$$

6) The decomposition of hydrogen peroxide ( $H_2O_2$ ) to form water and oxygen.



A) 25.0 grams of oxygen gas would be produced from how many grams of hydrogen peroxide?

$$25.0 \text{ g } O_2 \times \frac{1 \text{ mol } O_2}{32.00 \text{ g } O_2} \times \frac{2 \text{ mol } H_2O_2}{1 \text{ mol } O_2} \times \frac{34.02 \text{ g } H_2O_2}{1 \text{ mol } H_2O_2} = \boxed{53.2 \text{ g } H_2O_2}$$

B) 2.5 moles of hydrogen peroxide would produce how many moles of oxygen gas?

$$2.5 \text{ mol } H_2O_2 \times \frac{1 \text{ mol } O_2}{2 \text{ mol } H_2O_2} = \boxed{1.25 \text{ mol } O_2}$$

7) The reaction of nitric acid with potassium hydroxide to form potassium nitrate and water.



A) 35.0 grams of nitric acid would produce how many moles of water?

$$35.0 \text{ g } HNO_3 \times \frac{1 \text{ mol } HNO_3}{63.02 \text{ g } HNO_3} \times \frac{1 \text{ mol } H_2O}{1 \text{ mol } HNO_3} = \boxed{0.555 \text{ mol } H_2O}$$

B) 70.0 grams of potassium hydroxide will produce how many grams of potassium nitrate?

$$70.0 \text{ g } KOH \times \frac{1 \text{ mol } KOH}{56.11 \text{ g } KOH} \times \frac{1 \text{ mol } KNO_3}{1 \text{ mol } KOH} \times \frac{101.11 \text{ g } KNO_3}{1 \text{ mol } KNO_3} = \boxed{3.05 \text{ g } KNO_3}$$