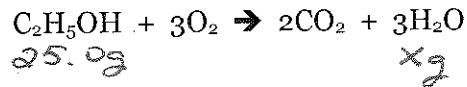


Name: \_\_\_\_\_  
 Date: \_\_\_\_\_ Mods: \_\_\_\_\_

# STOICHIOMETRY TEST REVIEW

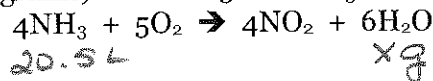
SHOW ALL WORK AND STEPS!!!!

1. In the following combustion reaction, how many grams of water are produced when 25.0 g of  $C_2H_5OH$  is burned?



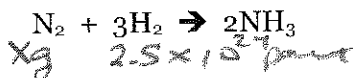
$$25.0g C_2H_5OH \frac{1 \text{ mole } C_2H_5OH}{46.08g C_2H_5OH} \frac{3 \text{ mole } H_2O}{1 \text{ mole } C_2H_5OH} \frac{18.02g H_2O}{1 \text{ mole } H_2O} = 29.3g H_2O$$

2. How much water is produced (in grams) when 20.5 L of  $NH_3$  is reacted?



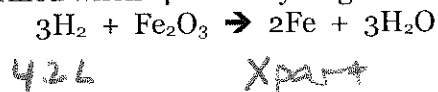
$$20.5L NH_3 \frac{1 \text{ mole } NH_3}{22.4L NH_3} \frac{6 \text{ mole } H_2O}{4 \text{ mole } NH_3} \frac{18.02g H_2O}{1 \text{ mole } H_2O} = 24.7g H_2O$$

3. How much  $N_2$  in grams is needed to react completely with  $2.5 \times 10^{24}$  particles of  $H_2$  in the following reaction?



$$2.5 \times 10^{24} \text{ part } H_2 \frac{1 \text{ mole } H_2}{6.022 \times 10^{23} \text{ part } H_2} \frac{1 \text{ mole } N_2}{3 \text{ mole } H_2} \frac{28.02g N_2}{1 \text{ mole } N_2} = 38.8g N_2$$

4. How many particles of iron is formed when 4.2 L of hydrogen react with hydrogen?



$$4.2L H_2 \frac{1 \text{ mole } H_2}{22.4L H_2} \frac{2 \text{ mole } Fe}{3 \text{ mole } H_2} \frac{6.022 \times 10^{23} \text{ part } Fe}{1 \text{ mole } Fe} = 7.53 \times 10^{22} \text{ part } Fe$$

5. Mass of Magnesium Lab

A) Write the balanced equation for the reaction between magnesium and hydrogen chloride:



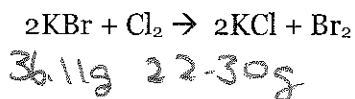
B) If the reaction is carried out in a eudiometer and the volume of hydrogen gas produced is measured to be 72.2 mL, calculate the mass of the original magnesium:

$$72.2 \text{ mL H}_2 \times \frac{1 \text{ L H}_2}{1000 \text{ mL H}_2} \times \frac{1 \text{ mole H}_2}{22.4 \text{ L H}_2} \times \frac{1 \text{ mole Mg}}{1 \text{ mole H}_2} \times \frac{24.31 \text{ g Mg}}{1 \text{ mole Mg}} = 0.0784 \text{ g Mg}$$

C) If the actual mass the magnesium is ~~0.09~~<sup>0.069g</sup> g, calculate the percent error.

$$\frac{|0.069 - 0.0784|}{0.069} \times 100 = 13.6\%$$

6. If 36.11 g of KBr react with 22.30 g of Cl<sub>2</sub>, determine the limiting reactant by calculating how many grams of Br<sub>2</sub> can be formed.



$$36.11\text{g KBr} \frac{1 \text{ mole KBr}}{119.00\text{g KBr}} \Bigg| \frac{1 \text{ mole Br}_2}{2 \text{ mole KBr}} \Bigg| \frac{159.80\text{g Br}_2}{1 \text{ mole Br}_2} = \boxed{24.2\text{g Br}_2}$$

$$22.30\text{g Cl}_2 \frac{1 \text{ mole Cl}_2}{70.9\text{g Cl}_2} \Bigg| \frac{1 \text{ mole Br}_2}{1 \text{ mole Cl}_2} \Bigg| \frac{159.80\text{g Br}_2}{1 \text{ mole Br}_2} = 50.3\text{g Br}_2$$

KBr is the limiting reactant

Calculate the amount of excess reactant.

$$36.11\text{g KBr} \frac{1 \text{ mole KBr}}{119.00\text{g KBr}} \Bigg| \frac{1 \text{ mole Cl}_2}{2 \text{ mole KBr}} \Bigg| \frac{70.90\text{g Cl}_2}{1 \text{ mole Cl}_2} = 10.76\text{g Cl}_2$$

$$22.30 - 10.76 = \boxed{11.54\text{g Cl}_2}$$

What is the percent yield if 20.41g Br<sub>2</sub> is produced experimentally?