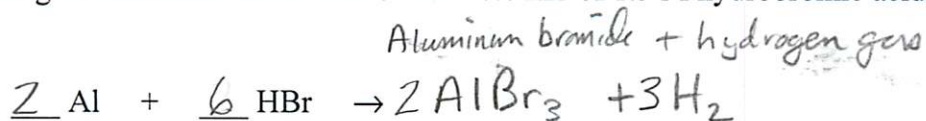


In addition, any of the material from this week will also be on the midterm (calculating molarity, making solutions using molarity, titration and naming molecular compounds)

1. 0.145 g of aluminum metal reacts with 10.0 mL of 1.5 M hydrobromic acid, as shown below



a. Determine if the reaction happens. If it does, write the formulas and names of the products and balance the equation.

b. What kind of reaction is this? *Single-Displacement*

c. Using the amounts of aluminum metal and HBr from the equation, determine which one is the limiting reactant. *Note Used H<sub>2</sub> in the problem but you could also find g AlBr<sub>3</sub>*

$$0.145 \text{ g Al} \times \frac{1 \text{ mol Al}}{26.98 \text{ g Al}} \times \frac{3 \text{ mol H}_2}{2 \text{ mol Al}} \times \frac{2.02 \text{ g H}_2}{1 \text{ mol H}_2} = \boxed{0.0163 \text{ g H}_2}$$

$$0.0100 \text{ L HBr} \times \frac{1.5 \text{ mol HBr}}{1 \text{ L}} \times \frac{3 \text{ mol H}_2}{6 \text{ mol HBr}} \times \frac{2.02 \text{ g H}_2}{1 \text{ mol H}_2} = \boxed{0.0152 \text{ g H}_2}$$

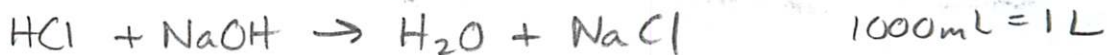
*\* HBr is limiting R.*

2. You are asked to make 200 mL of a 0.500 M solution of zinc sulfate. How many grams of zinc sulfate do you need?

*1 L = 1000 mL*

$$0.200 \text{ L ZnSO}_4 \times \frac{0.500 \text{ mol ZnSO}_4}{1 \text{ L}} \times \frac{161.44 \text{ g ZnSO}_4}{1 \text{ mol ZnSO}_4} = \boxed{16.1 \text{ g ZnSO}_4}$$

3. You titrated 10 mL of HCl with 9.8 mL of 2.0 M NaOH. What is the molarity of the HCl?



$$0.0098 \text{ L NaOH} \times \frac{2.0 \text{ mol NaOH}}{1 \text{ L}} \times \frac{1 \text{ mol HCl}}{1 \text{ mol NaOH}} = 0.020 \text{ mol HCl}$$

$$M = \frac{\text{mol}}{\text{L}} = \frac{0.020 \text{ mol HCl}}{0.010 \text{ L}} = \boxed{2.0 \text{ M}} \rightarrow \text{molarity of HCl}$$

4. Name the following compounds (some are molecular or ionic. Name any acids using acid naming rules:

- a.  $N_2O_3$  → dinitrogen trioxide
- b.  $CO$  → carbon monoxide
- c.  $P_2O_5$  → diphosphorus pentoxide
- d.  $SO_2$  → sulfur dioxide
- e.  $Fe_2O_3$  → iron (III) oxide
- f.  $HI$  → hydroiodic acid
- g.  $CaCO_3$  → calcium carbonate