Worksheet 12 – CHEM 121 – Fall 2015 Monday Name: _____

Wednesday Name: _____

Directions: First 40 minutes with partner, non-programmable calculator; no notes – next 10 minutes with notes – remaining 25 minutes at the board.

1) $5 \cdot 10^{22}$ atoms of Li_2CO_3 are how many moles of Li_2CO_3?

2) $7 \cdot 10^{23}$ atoms of $SrCl_2$ are how many mols of $SrCl_2$?

3) $4 \cdot 10^{20}$ atoms of Li_2CO_3 are how many grams of Li_2CO_3?

4) Determine the % composition of Li in $Li_3C_6H_5O_7$.

5) Determine the % composition of Ca in $CaSO_4 \cdot 4H_2O$.

6) Determine the % composition of Mg in $MgNH_4PO_4$.

7) Determine the % composition of H in $MgNH_4PO_4$.

8) Determine the % composition of Cu in $Cu_3(AsO_4)\cdot Cu(C_2H_3O_2)_2$.

9) 98 g H_2SO_4 are dissolved in 0.5 L H_2O. What is the resulting molarity of the solution?

10) 80 g NaOH are dissolved in 250 mL H_2O. What is the molarity of the solution?

11) 9.125 g HCl are dissolved in 300 mL H_2O. What is the molarity of the solution?

12) How many grams of $Al(OH)_3$ are required to make a solution 0.25 M in 500 mL of solution?

13) 31.5 g HNO_3 are dissolved in 1 L H_2O. What is the molarity of the solution?

14) For the reaction $SrCO_3 + 2HCl \rightarrow SrCl_2 + CO_2\uparrow + H_2O$, how many grams of $SrCl_2$ are produced when 5 mL of 4 M $SrCO_3$ are reacted with HCl?

15) For the reaction $2HCl + CaCO_3 \rightarrow CaCl_2 + CO_2\uparrow + H_2O$, how many grams $CaCl_2$ are produced when 45 mL 0.34 M $CaCO_3$ react with the HCl?

16) For the reaction $NaHCO_3 + HC_2H_3O_2 \rightarrow NaC_2H_3O_2 + CO_2\uparrow + H_2O$, how many mL of 0.5 M $HC_2H_3O_2$ are required to react with 10 g $NaHCO_3$?

17) How many mL of 0.33 M HNO_3 are required to react with 15 g AgCl as follows: $HNO_3 + AgCl \rightarrow AgNO_3 + HCl$?

18) For the following reaction: $N_2 + 3I_2 \rightarrow 2NI_3$, if you start with 25 g I_2 and you obtain 15 g NI_3, what is the per cent yield of NI_3?

19) For the following reaction: $2Na + 2H_2O \rightarrow 2NaOH + H_2\uparrow$, if you start with 10 g Na and you obtain 8 g NaOH, what is the per cent yield of NaOH?

20) For the following reaction: $CO_2 + NH_3 \rightarrow CH_4N_2O$ (urea) + H_2O, if you start with 6 g CO_2 and obtain 5 g urea, what is the per cent yield of urea?

21) If 2 mol HCl reacts with $AgNO_3$ as follows: HCl + $AgNO_3 \rightarrow$ AgCl + HNO3, how many mol AgCl are produced?

22) If 36.5 g HCl reacts with $AgNO_3$ as above, how many grams of AgCl will be produced?

23) If you also have 10 g $AgNO_3$ for the above two questions, which reagent is the limiting reagent?

24) Given the following reaction: $N_2 + 3I_2 \rightarrow 2NI_3$, if you have 28 g N_2, how many grams of NI_3 will you be able to make?

25) If you also have 50 g I_2 for the above reaction in #24, what is the limiting reagent?