**Unit 6C: Stoichiometry Study Guide** Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_

1. Balance and determine the reaction type:
   1. \_\_\_\_\_Mg + \_\_\_\_\_O2 🡺 \_\_\_\_\_MgO Rxn Type:\_\_\_\_\_\_\_\_\_\_
   2. \_\_\_\_\_Mg + \_\_\_\_\_Co(NO3)2 🡺 \_\_\_\_\_Co + \_\_\_\_\_Mg(NO3)2 Rxn Type:\_\_\_\_\_\_\_\_\_\_
   3. \_\_\_\_\_Sr(OH)2 + \_\_\_\_\_HCl 🡺 \_\_\_\_\_SrCl2 + \_\_\_\_\_H2O Rxn Type:\_\_\_\_\_\_\_\_\_\_
   4. \_\_\_\_\_C2H6 + \_\_\_\_\_O2 🡺 \_\_\_\_\_CO2 + \_\_\_\_\_H2O Rxn Type:\_\_\_\_\_\_\_\_\_\_
2. 2 Na + Cl2 🡺 2 NaCl ∆H = − 411.12 kJ
   1. Is the reaction endothermic or exothermic?
   2. How many grams of chlorine gas is needed to produce 0.75 moles of sodium chloride?
   3. How many particles of NaCl will be produced when 35 grams of Na reacts with excess chlorine?
3. CaCO3 🡺 CaO + CO2 ∆H = + 176.8 kJ
   1. Is the reaction endothermic or exothermic?
   2. How many liters of carbon dioxide are produced at STP when 25.0 g of calcium carbonate decompose?
   3. How many grams of CaCO3 are required to produce 4.11 grams of CaO?
4. C (s) + 2 H2 (g) 🡺 CH4 (g) + 74.3 kJ
   1. Is the reaction endothermic or exothermic?
   2. How many liters of CH4 will be produced when 31 grams of carbon react with excess hydrogen at STP?
   3. How many grams of carbon are required to react with 4.22 x 1024 molecules of H2?
   4. 55 liters of H2 at STP react with excess carbon. How many moles of CH4 will be produced?
5. 2 Al + 3 Cl2 🡺 2 AlCl3

Aluminum reacts with chlorine to produce aluminum chloride according to the equation above. 4.25 x 1022 atoms of aluminum are mixed with 18.23 grams of chlorine gas and allowed to react.

* 1. What is the limiting reactant?
  2. What is the excess reactant?
  3. How many grams of the excess reactant remain after the reaction?
  4. What is the maximum mass (theoretical yield) of aluminum chloride that will be made?
  5. What is the percent yield if 7.48 g of aluminum chloride is produced in lab?