**Quiz 8A**

# Directions: Answer each of the following questions. Be sure to use complete sentences where appropriate. For full credit be sure to show all of your work. Where appropriate answers should be boxed for clarity, written to the correct number of significant figures, and, include the proper units.

1. Consider the reaction of 10.21 g of sodium metal with 12.87 g of chlorine gas to produce sodium chloride (20 points).
   1. What is the initial moles of sodium metal?
   2. What is the initial moles of chlorine gas?
   3. Complete the following table using the unbalanced equation:

|  |  |  |  |
| --- | --- | --- | --- |
|  | 2 Na  (s) + | Cl2 (g) → | 2 NaCl (s) |
| I | 0.4441 mol Na | 0.1815 mol Cl2 | 0 mol |
| C | -2x | -x | +2x |
| E | 0.4441 mol – 2x =  0.4441 mol – 2(0.1815 mol) =  0.0811 mol | 0.1815 mol – x =  0.1815 mol – 0.1815 mol =  0 mol | 2x =  2(0.1815 mol) =   * 1. mol |

Determine the liming reagent by comparing the theoretical mole ratio to the actual mole ratio:

|  |  |  |
| --- | --- | --- |
| Theoretical mole ratio | Actual mole ratio | Limiting reagent is  Cl2 |

* 1. What does x equal?
  2. How many grams of sodium chloride could be produced?
  3. If 10.234 g of sodium chloride is produced, what is the percent yield?
  4. How many grams of the excess reagent is left over that the end of the reaction?