In-class exercise #4: Reaction Stoichiometry Problems

**Sample reaction 1**

C3H8 + 5O2--------🡪 3CO2 + 4H2O

44 32 44 18 g/mol

m= w/MW **moles (m)** m=N/6.0\*1023

**w** = m\****MW*** N= m\**6.0\*1023*

**weights (w) molecule (atom) count (N)**

MW = mass of species/mol = **M**olecular **W**eight

**a) moles to moles** How many moles of O2 will burn to form 0.60 moles of CO2  ?

**b) moles to weight** How many grams of CO2 are generated if 0.00757 moles of C3H8 are burned?

**c) weight to moles** How many moles of H2O form if 11 g of C3H8 are burned ?

**d) weight to weight** How many grams of O2 are needed to burn 0.275 g C3H8 ?

**e) weight to count** How many molecules of CO2 form if 0.398 g H2O results ?

**f) count to weight** How many grams of O2 are needed to form 1.50\*1022 molecules of H2O ?

**Sample Reaction 2**

6HCl + 2Al -----🡪 2AlCl3 + 3H2

36 27 123 2 g/mol

a) **moles to moles:** How many moles of Al must be added to produce 15 moles of H2 ?

b)**moles to weight:** How many grams of H2 are created by reacting 10 moles of HCl ?

c) **weight to moles:** How many moles of HCl can combine with 90 g of Al ?

**d) weight to weight:** How many grams of Al must react to form 1.1111 grams of H2 ?

e**) weight to count:** How many molecules of HCl are needed to make 68.33 g AlCl3?

**f) count to weight:** how many grams of Al produce 3.333 \*1023 molecules of H2 ?