

## CHEM 101: STOICHIOMETRY PROBLEMS TYPES AND STEPS

### **Type 1: Mole-Mole: Given moles you want to find moles of another.**

- Write down given with units of moles.
- Multiply** given by mole ratio (fraction) of unknown/known found from coefficients in balanced equation for reaction; where unknown equals coefficient of what you are trying to find.
- Write down answer with correct unit of moles unknown.

### **Type 2: Mole-Mass: Given moles you want to find grams of another.**

- Write down given with units of moles.
- Multiply** given by mole ratio (fraction) of unknown/known found from coefficients in balanced equation for reaction; where unknown equals what you are trying to find.
- Multiply answer to Step b. by gram formula mass of unknown (add up atomic masses from Periodic Table, round to nearest hundredth place).
- Write down answer with correct unit of grams unknown.

### **Type 3: Mass-Mole: Given grams you want to find moles of another.**

- Write down given with units of grams.
- Divide** given by its gram formula mass (add up atomic masses from Periodic Table, round to nearest hundredth place).
- Multiply answer to step b. by mole ratio (fraction) of unknown/known found from coefficients in balanced equation for reaction; where unknown equals coefficient of what you are trying to find.
- Write down answer with correct units of moles unknown.

### **Type 4: Mass-Mass: Given grams you want to find grams of another.**

- Write down given with units of grams.
- Divide** given by its gram formula mass (add up atomic masses from Periodic Table, round to nearest hundredth place).
- Multiply answer to step b. by mole ratio (fraction) of unknown/known found from coefficients in balanced equation for reaction; where unknown equals coefficient of what you are trying to find.
- Multiply answer to step c. by gram formula mass of unknown (add up atomic masses from Periodic Table, round to nearest hundredth place).
- Write down answer with correct unit of grams unknown.

### **Type 5: Limiting Reactant: Given data for 2 or more of the reactants, you want to find how much product you can obtain.**

- Choose one of the reactants given and go through the steps for one of the four types above assuming you want to find how much of the other reactant is needed to react with it.
- Depending on whether or not you have enough of the other reactant to completely consume the one you chose, determine the limiting reactant (the one you don't have sufficient quantity).
- Use the limiting reactant's mass (or mole) value to determine how much product you can produce.

