Stoichiometry Notes

Stoichiometry –

Based on law of conservation of \_\_\_\_\_\_\_\_\_\_\_\_\_: \_\_\_\_\_\_\_\_\_\_\_\_\_ of reactants \_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of products

A balanced chemical equation tells you three main amounts:



Example: 4Fe + 3O2 = 2Fe2O2

* Particles =
* Moles =
* Mass =
* Law of conservation of mass =

Mole ratio - Ratio between **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of any **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** in a balanced chemical equation

Example: 2K + Br₂ = 2KBrWrite the mole ratios:

# of mole ratios = (n) x (n-1)

* n =
* 4 substances: (4) x (4-1) =
* 5 substances: (5) x (5-1) =

Using Stoichiometry – always start with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This tells you the correct amount of **\_\_\_\_\_\_\_\_\_\_\_** for each substance

Mole to Mole conversion



Mole to Mass conversion



Mass to Mass conversion



Limiting Reactants

A chemical reaction stops when \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Limiting reactants - Limits the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* Excess reactants - Reactants **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** when a reaction stops

Steps to Solving Limiting Reactant Problems

1. Calculate limiting reactant
2. Convert mass to moles by \_\_\_\_\_\_\_\_\_\_\_\_\_ by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for each reactant
3. Determine the correct \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of reactants
4. The reactant that doesn’t match up to the correct mole ratio is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Calculate the amount of product formed
6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_mole amount of limiting reactant by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of product over limiting reactant
7. Convert moles of product to mass by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by molar mass
8. Analyze excess reactant
9. Multiply mol of limiting reactant by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to find mol of excess reactant
10. Multiply mol of excess reactant by it’s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to find mass
11. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ amount needed from available amount to find amount of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Percent Yield

Percent Yield describes the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a chemical reaction

Reasons for not producing theoretical amounts:



Theoretical yield – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ amount of product that can be produced from a given \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Actual yield - **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** produced when a chemical reaction is carried out in **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Percent yield - Ratio of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ shown as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_