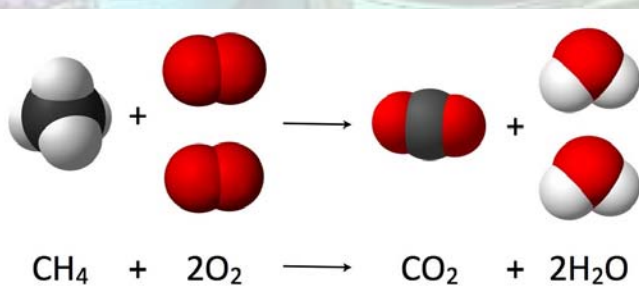


Stoichiometry

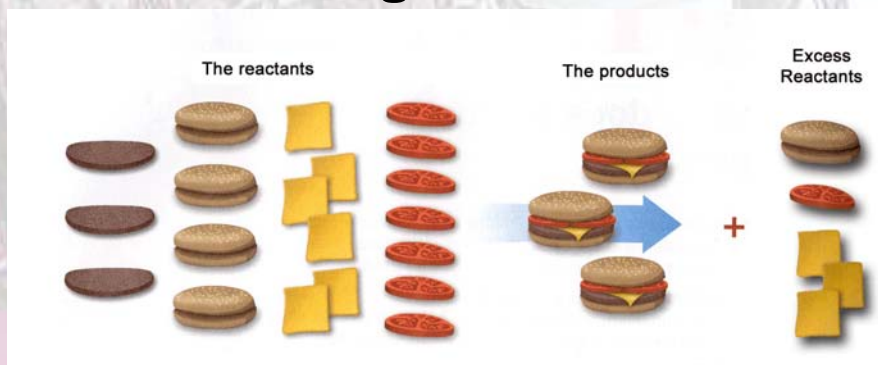
- Stoichiometry is a fancy chemistry word meaning “to calculate quantities in a chemical reaction”. Or in other words, if I mix this much of “X” and this much of “Y” they will react to form this much of “Z”.
- In most stoichiometry problems we are using a known mass and the balanced equation coefficients to determine the mass of an unknown

Stoichiometry

- Keep in mind that the coefficients in the balanced equation are ***mole*** ratios, NOT mass ratios (this means you have to get things into moles first)



Limiting Reactants



- **Limiting reactant:** the reactant that is completely consumed in a reaction and limits the amount of product formed

Stoichiometry Steps

1. Write and balance the chemical equation
2. Convert the mass of the known chemical to moles
 $(\text{mass}/\text{molar mass}) = \text{moles}$
3. Determine limiting reagent (limiting reagent is the reagent that doesn't fulfill the mole ratio of the balanced equation). Use the coefficients of the balanced equation to determine the mole ratios.

Stoichiometry

4. Use the mole ratio to find moles of unknown chemical(s).
Use the moles of the ***limiting reagent*** to determine the moles of the unknown.

$$(\text{moles of known}) \cdot \left(\frac{\text{coefficient of unknown}}{\text{coefficient of known}} \right) = \text{moles of unknown}$$

5. Convert moles of unknown chemical to mass
moles x molar mass = mass
6. Repeat if necessary for other chemicals

Just a note...

A common question is – “do you include the balancing coefficient in the molar mass?” The answer is – NO!
You need to use the subscripts in the molar mass, but NOT the balancing coefficients!