Achem Final Review

- Significant figures
- Periodicity and Quantum
- Ionic Bonding
- Covalent Bonding
- Chemical Reactions and Equations
- Mole & Stoichiometry
- A&B
- Hydrocarbons

Significant Figures

- ID the number of significant figures in the following:
  - 0.00230340
  - 303
  - 3030
  - 500.
  - 783.00
- Perform the following calculations with the correct number of significant figures:
  - 74.820-53.1
  - 8.30 x 0.021 =

Periodic Trends

- Write electron configuration for Ca and Ca^{+2}
- Which atom has a larger atomic radii: Mg or S?
- Which has a larger radius: Mg and Mg^{+2}

Ionic Bonding

- Write the correct ionic formula for:
  - Calcium phosphide
  - Ammonium bicarbonate
  - Barium acetate
  - Tin (IV) oxide

Covalent Bonding

- Draw a Lewis structure for:
  - Ammonia
  - Sulfate ion
  - Sulfur trioxide
  - Sulfur hexafluoride
- Identify the VSEPR geometry for the above molecules

Types of Bonding

1. What rule explains why ions form?

2. Metals typically have a _____ charge while nonmetals typically have a _____ charge

3. Write the ionic formula for Calcium Hydroxide

4. An ionic bond occurs between _____, while a covalent bond occurs between _____.

Reactions and Equations

1. Write a balanced net ionic equation for the reaction between Calcium Hydroxide and Sodium Sulfate.

2. What type of reaction is described in question 1.

3. A combustion reaction always produces: _____

Mole

1. Calculate the molar mass of methane
2. If you have 2.4g of methane, how many moles are present?
3. If you have 2.4g of methane, how many molecules are present?
4. If you have 4.58×10^{26} apples, how many moles of apples do you have.
5. Calculate the percent composition of methane

A&B

- Classify the following as acidic or basic
  - HNO_3
  - NaClO
  - NaOH
  - HBr
  - $HC_2H_3O_2$
- Name the above species
- Calcluate the $[OH^-]$ if the pH = 5
- Calcluate the pH of a solution if 0.5g HCl are dissolved in 2.5L of water

Organic

1. Name a 7 chain hydrocarbon that has a double bond between the second and third carbon.
2. Draw the above molecule using structural formula, condensed formula, and shorthand
3. What is the relationship between a monomer and a polymer?
4. What functional group has a nitrogen connected to a carbon that has a double bond to an oxygen?
5. What functional group contains a carbon- oxygen double bond with 2 R groups on either side of the carbon atom?
6. What functional group is represented by ‘COOH?
7. What functional group is represented by ‘CO_2R?