Chem 101 Exam 1 Objectives

Note: this is not an exhaustive list! It is just meant to give you a place to start! Questions may be asked that don't appear on this list and some questions may require you to integrate multiple topics.

- Convert between measurements of different units using dimensional analysis (unit cancelling)
  - Including compound units such as m/s to ft/hour, etc.
- Use the density equation (d=m/v) and solve problems with density and both a mathematical and conceptual level.
- Distinguish between elements, compounds, and homogeneous and heterogeneous mixtures at the macroscopic, microscopic, and symbolic levels.
- Distinguish between chemical and physical changes at the macroscopic, microscopic, and symbolic levels.
- Name and write formulas for common covalent and ionic compounds.
  - Identify stable ions of elements on the periodic table.
  - Memorize the polyatomic ions and use when naming ionic compounds
  - Use Roman numerals to correctly indicate transition metal charge when needed
  - Use proper prefixes when naming covalent compounds.
- Determine the number of protons, neutrons, and electrons in any neutral atom or ion on the periodic table.
- Determine the molar mass of any compound.
- Define a mole and explain how and why it is used to count atoms in chemistry.
- Convert between mass, moles, molecules, and atoms of any substance.
- Determine the empirical and molecular formulas of a substance given percent composition or mass data.
- Determine the percent composition of each element given a chemical formula.
- Identify the principles of kinetic molecular theory and use these to explain gas particle movement.
- Explain a demonstration or phenomena using kinetic molecular theory at the macroscopic and microscopic levels.
- Explain how an ideal gas differs from a real gas.
  - Explain pressure and temperature conditions where gases behave most ideally.
- Explain basic gas laws using kinetic molecular theory (i.e. explain why the law is the way it is based on the movement of particles).
  Examples:
  - P and T relationship (V and n constant)
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- Use the ideal gas law to solve basic problems. (PV=nRT)
- Use the ideal gas law to derive other gas law relationships.
- Use Dalton's law of partial pressures to solve problems involving multiple gases consisting of different substances.