

Chemistry 201 course objectives

This list of objectives is intended to cover the major topics covered by all instructors in this course. The student should be able to demonstrate an understanding of the following:

I. CONCEPTUAL UNDERSTANDING.

1. The scientific method and the proper use of significant figures.
2. Writing correct formulas and nomenclature for elements and inorganic compounds.
3. Different types of reactions: acid-base, displacement and oxidation-reduction reactions.
4. Properties of solids, liquids and gases related to the Kinetic Molecular Theory.
5. Specific heat, basic calorimetry and heats associated with phase changes.
6. Atomic and molecular structure and their relationship to physical and chemical properties.
7. Arrangement of Periodic table and periodicity in chemical and physical properties.
8. Ionic and covalent bonding, Lewis structures, hybrid orbitals, and the VSEPR theory.
9. Acids and bases; definitions, general properties, pH scale

II. PROBLEM SOLVING SKILLS

1. Metric unit conversions involving length, mass, volume and temperature.
2. Density problems
3. Balancing equations
4. Molecular mass and % composition calculations
5. Empirical formulas from % composition and vice versa
6. Interconversions between moles/grams/number of atoms/molecules
7. Mass-mass stoichiometry problems including limiting reagents
8. Stoichiometry problems involving molarity
9. Stoichiometry problems involving volume of gases
10. Calculations involving ideal gases
11. Specific heat and calculations of heat involved in phase changes
12. Calculations with solutions: mass %, molarity, dilution problems, and molality
13. Calculation of pH from hydrogen ion concentration
14. Calculations involving light: wavelength, frequency, energy