

CHM 130 Final Exam Review

Matter

- Scientific Method
- Matter, states of matter
- Properties of solids, liquids, and gases
- Chemical vs physical properties/changes
- Elements, compounds, mixtures
- Element symbols
- Diatomic molecules

Math Skills

- Measurements and exact numbers
- Significant digits
- Rounding
- Calculations: add/sub, mult/div
- Scientific notation
- Percents

Metric Units and Conversions

- Metric system
- Metric prefixes
- Metric conversions
- English conversions
- Conversions between systems
- Density
- Volume by Displacement and calculation
- Temperature
- Heat and Energy

Atoms

- Dalton and Atomic Theory
- Thomson and the electron
- Rutherford and the nucleus
- Protons, neutrons, electrons in atoms
- Atomic notation, atomic number, atomic mass
- Isotopes
- Chemical formulas, number of atoms

Atomic Structure

- Electromagnetic Spectrum
- Bohr's model
- Electron levels, sublevels, orbitals
- Electron configuration of atoms
- Valence electrons
- Ion formation – electron configuration of ions
- Ionic charges – isoelectronic
- Protons, neutrons, electrons in ions

Periodic Table

- Periodic table's shape (s,p,d,f)
- Periodic Law
- Periods, groups and group names
- metals, nonmetals, metalloids
- Atomic size
- Ionization energy
- Electronegativity

Chemical Bonding

- Ionic bonding
- Covalent bonding and the octet
- Lewis dot structures of atoms
- Lewis dot structures of simple covalent molecule
- Lewis dot structures of polyatomic ions
- Shapes of molecules (table given)
- Bond polarity
- Molecular polarity

Nomenclature

- Names of atoms
- Charges of Ions
- Ionic formulas
- Naming ionic compounds
- Naming covalent compounds

Acids and Bases

- Arrhenius acids and bases
- Strong vs weak acids and bases
- pH, buffers, neutralization reactions
- Strong vs weak acids and bases
- Solubility rules, Electrolytes
- Beaker Drawings

Chemical Reactions

- Law of Conservation of Matter
- Balancing chemical reactions
- Classifying chemical reactions
 - Combination
 - Decomposition
 - Combustion
 - Single replacement
 - Double replacement
 - Acid base neutralization
- Activity series
- Oxidation and reduction
- Predicting products

Equilibrium

- Collision Theory
- Rate of a reaction
- Equilibrium
- Energy profiles, ΔH

The Mole

- The mole and Avogadro's number
- Molar mass
- Converting between grams and moles and atoms/molecules
- Molar volume
- Converting between liters and moles at STP
- Percent Composition

Stoichiometry

- Mole-mole ratios
- Mass-mass stoichiometry
- Mass-volume stoichiometry
- Volume-volume stoichiometry

IMF

- Properties of liquids
- IMF – LDF, DDF, HBF, IDF
- Differences between bonds and IMF
- VP, surface tension, bp, viscosity
- Water facts
- Heat curves

Solutions

- Solution, solute, solvent, soluble, miscible/immiscible
- like dissolves like
- Concentration, Molarity, Mass Percent