

Honors Chemistry Semester Two final: What to study

You should have plenty of material to study from. Use quizzes, lab quizzes, unit review worksheets, notes, and corrected assignments. Your textbook has self-check quizzes you can do at www.chemistrymc.com.

Unit 5: Stoichiometry

≈ 10%

Chapter 12: Stoichiometry

- ☑ Mole Ratio
- ☑ Mole to Mole, Mole to Mass, and Mass to Mass Conversions
- ☑ Definitions of: Limiting reactant, excess reactant, theoretical yield, percent yield, and Law of Conservation of Matter
- ☑ Limiting reactant calculations
- ☑ Theoretical yield calculations and Percent yield calculations

Unit 6: States of Matter

≈ 20%

Chapter 13: States of Matter

Chapter 14: Gases

- ☑ Intermolecular Forces in liquids (London dispersion, Dipole-dipole, H-bonding) and Strength of intermolecular forces
- ☑ Polarity Vs. Type of Intermolecular force
- ☑ Determining highest boiling or melting point based on strongest IMF
- ☑ Definition of Vapor pressure and Reading vapor pressure curves
- ☑ Relationship between vapor pressure and strength of IMF
- ☑ Changes of State (freezing, melting, sublimation, etc.)
- ☑ Reading Phase Diagrams (determining state (s, l, g) at a certain temperature and pressure, critical point, triple point, using slope of solid-liquid line to determine density, and finding normal BP and FP)
- ☑ Definitions of critical point and triple point
- ☑ Pressure conversions (atm to mmHg, kPa to atm, etc)
- ☑ Temperature conversions (K and °C only)
- ☑ Kinetic Molecular Theory Postulates
- ☑ Definition of Gas Pressure, Absolute Zero, STP, diffusion, & effusion
- ☑ Dalton's Law Calculations and Graham's Law Calculations
- ☑ Combined Gas Law calculations
- ☑ Charles', Gay-Lussac's, Boyle's Law calculations and relationships
- ☑ Direct Vs. Inverse relationships (definition and graph)
- ☑ Definition of an Ideal gas and Ideal Gas Law Calculations
- ☑ Ideal Gas Law Calculations involving Molar Mass
- ☑ Definition of Avogadro's Principle
- ☑ Gas Stoichiometry at STP

Unit 7: Thermochemistry

≈ 20%

Chapter 16: Energy and Chemical Change

- ☑ Types of energy, & Law of conservation of energy
- ☑ Definition of heat vs definition of temperature
- ☑ Energy unit conversions (Joules, calories, etc)
- ☑ Definition of specific heat
- ☑ Energy calculations using $q = mc\Delta T$
- ☑ Calorimeter Parts and Calorimeter calculations
- ☑ Enthalpy definition and Enthalpy Stoichiometry calculations
- ☑ Identifying endothermic and exothermic reactions or processes (ex: melting is endothermic because it requires heat to change phase)
- ☑ Heating and cooling curves (Parts of the graph, calculations, Kinetic energy vs Potential energy, Normal melting, boiling, freezing and condensing points)
- ☑ Hess's Law definition and calculations
- ☑ Standard enthalpy of formation calculations
- ☑ Definition of entropy and Identifying changes in entropy
- ☑ Definition of Spontaneous reactions and Gibbs Free Energy
- ☑ Gibbs Free Energy calculations
- ☑ Predicting the sign of ΔG based on entropy and enthalpy
- ☑ Know what signs for ΔH , ΔS , and ΔG mean for each

Unit 8: Solutions

≈ 30%

Chapter 15: Solutions

Chapter 17: Reaction Rates (17.1 and 17.2 only)

Chapter 18: Equilibrium (18.1 and 18.2 only)

- ☑ Definitions of solute, solvent, solution, miscible, immiscible, solvation, saturated, unsaturated, supersaturated, solubility
- ☑ "Like dissolves Like" (polar vs non-polar solutes & solvents)
- ☑ Factors that affect solubility of solids and factors for gases
- ☑ Reading Solubility Curves
- ☑ Concentration calculations (molarity, %conc, molality, and dilution)
- ☑ Definitions of colligative properties and understanding of Vapor pressure depression, Freezing Point depression, and BP elevation
- ☑ Calculations for freezing point depression and BP elevation
- ☑ Van't Hoff Factor
- ☑ Definition of Reaction Rates, Activation energy, Activated complex (transition state), catalyst, inhibitor
- ☑ Collision Theory and successful collision requirements

- ☑ Reading Reaction Coordinates (Potential energy diagrams) to determine endo or exo, activation energy, potential energy reactants or products, and value of ΔH
- ☑ Factors that affect reaction rate (surface area, concentration, temperature, and catalyst)
- ☑ Definition of reversible reactions and equilibrium
- ☑ Writing an equilibrium expression and using values to calculate K
- ☑ Using the value of K to determine if the reaction is product favored
- ☑ Conditions of K (only valid at one temperature)
- ☑ Le Chatelier's principle definition and types of stress
- ☑ Predicting shifts in equilibrium by changing concentration, temperature, or pressure
- ☑ Determining if the reactants or products increase or decrease after a shift in equilibrium has occurred
- ☑ Determining how K is affected by changes in temperature

Unit 9: Acids and Bases

≈ 10%

Chapter 19: Acids and Bases

- ☑ Properties of acids and bases
- ☑ Definition of caustic and corrosive
- ☑ pH scale
- ☑ Identifying Monoprotic or Polyprotic (diprotic, triprotic, etc) Acids
- ☑ Strong Acids Vs Weak Acids (% ionization only)
- ☑ Arrhenius definition of an acid and base
- ☑ Bronstead-Lowry definition of an acid and base
- ☑ Identifying Bronstead-Lowry acid, base, conjugate acids, and conjugate base in a reaction
- ☑ Predicting conjugate acid or conjugate base
- ☑ pH calculations (calculator and non-calculator problems)
- ☑ Definition of pH, acidic and basic solutions
- ☑ Definition of neutralization and products of neutralization
- ☑ Neutralization calculations
- ☑ Definition of equivalence point, end point, titration, and standard solution
- ☑ Location of the following during a titration (indicator, unknown solution, and standard solution)

Unit 10: Redox

≈ 10%

Chapter 20: Redox

Chapter 21: Electrochem

- ☑ Assigning oxidation numbers
- ☑ Identifying oxidation and reduction and oxidizing agents and reducing agents.
- ☑ Determining if a reaction is a redox reaction
- ☑ Definition of oxidation and reduction
- ☑ Voltaic/Galvanic cell parts
- ☑ Using standard reduction potentials to predict the anode and cathode in a voltaic cell
- ☑ Knowing which electrode grows and which shrinks
- ☑ Writing an overall reaction
- ☑ Cell notation
- ☑ Balancing redox reactions in acidic and basic solutions

On Test Day: Come prepared! Bring scientific calculator, pencil, and _____ . If you finish early, you may read or work on something from another class. You may NOT listen to music or play a game with a friend.