

Modeling Chemistry – Honors
Final Examination Review

This final examination is 100 multiple-choice questions covering topics from the entire year. There is a strong emphasis on second semester topics. Nonetheless, some of the topics from semester one have been essential to our understanding of semester two topics; therefore, the test is cumulative for the year. The following is a list of topics tested on the exam. Make sure you arrive prepared with a #2 pencil, calculator, periodic table and barricade materials.

Electron configurations and the periodic table

Electron configurations

Conversions using dimensional analysis

Significant figures

Significant figures and calculations (e.g. multiplying, addition)

Groups on the periodic table

Quantum Rules: Pauli exclusion, Hund's, Aufbau principle

Principal Quantum Number, n

Neils Bohr and his theory

Electromagnetic radiation (e.g. light) and wavelength, frequency, energy, and speed.

Oxidation and Reduction (Redox) LEO the lion says GER

Atomic masses and isotopes (e.g. why isn't Carbon exactly 12 g per mole?)

Solutions and solute concentration – making solutions - Molarity

Stoichiometry Problems (including percent yield)

Electrochemical cells (cations are reduced at the cathode)

Energy: Kinetic, Interaction, Chemical

Law of conservation of energy (Energy is Energy, just different forms. Like money is money)

Accuracy vs. Precision (AC & PR)

pH scale: acidic, neutral, basic

Isotopes

Density and changes of state

Empirical Formula (including from percent composition)

Percent Composition by mass

Balancing chemical equations (coefficients and subscripts)

Particle diagrams and solutions

Types of reactions (synthesis, decomposition, single-replacement, double-replacement, combustion)

Precipitate

Excess and limiting reactants

Actual, Theoretical, and Percent Yield

The Mole!

Molar masses of compounds (e.g. sodium chloride is 58.5 g/mol)

Aqueous

Particle diagrams and elements, compounds, molecules, crystal lattice, mixtures, etc.

Molarity

Properties of Acids and Bases

Rutherford's nucleus and the solar system model
Arrangement of the periodic table
Endothermic vs. Exothermic reactions
Evidence of chemical change (precipitate, heat, color change, gas)
Law of conservation of mass
Law of conservation of mass and balancing chemical equations (what is conserved?)
Law of conservation of mass and solutions
Naming compounds, writing chemical formulas, Ionic and molecular
Polyatomic ions
Roman numerals in chemical names
Properties of metals, ions, molecules, covalent-networks
Alloys
Anions and Cations
Temperature
Calorimeters and Calorimetry
Conversions (atm and mmHg, Kelvin to Celsius, grams to moles, moles to number of particles)
Electrolytes
IFE tables and properties of gases (or gas laws: $P_1V_1 = P_2V_2$: Boyle's law, etc)
Conversions (kilo-, centi-, milli-, and nano-)
Matter
Cubic centimeters and milliliters (milk carton lab – U2)
Gold-foil experiment
Nucleus of an atom
Atomic Number
Solution Stoichiometry