AR Chemistry: Semester 1 Final

You may be surprised at how much information you have studied this semester. The Final Exam will be given during your class in the AR Finals Schedule. The exam will be 100 multiple choice questions. Review Sets with answers will be given prior to the exam. If possible, you will receive an accurate description of the final (eg. 5 questions on naming ionic compounds, 3 questions on making formulas, etc.)

You will be allowed 1 page of notes, hand written or typed. You may have notes, terms, examples and such on your notes page. **YOU MAY NOT have photocopied review sets or review set examples on your notes page.**
The Final exam will cover the following topics: (Periodic Table + common ions handout will be given)

Matter and Change

States of Matter: gas, liquid, solid, plasma
Physical properties and physical changes
Chemical properties and chemical changes
Classification of matter:
elements, compounds, mixtures
Separation of mixtures
chromatography, centrifugation, distillation
Chemical reactions:
Reactants → Products
Conservation of mass

Atomic Structure

Atomic Parts: Proton, Neutron, electron, Nucleus
Atomic Mass: elements and compounds
Atomic Number
Isotopes
Ions
Number of P^{+1}, N^{0}, $^{e\text{-}1in}$ Neutral Atoms and Ions

Chemical Names and Formulas

Ionic Charges
Determination of Ionic Formulas
Naming Ionic Compounds
Creating Formula from Names
HOFBrINCl story

Chemical Reactions

Double Replacement Reactions

States of Matter

Pressure
Gas Pressure: atmospheres, mm Hg, psi
Poisson Distribution
Liquids
IMA, Vapor Pressure
Spacing between solids, liquids, gases
Heating Curve
Warming, melting, warming, boiling, warming

Electrons In Atoms

History
Democritus, Aristotle, Dalton, Thompson, Rutherford, Millikan, Planck, Bohr, Heisenberg, Einstein
Models
Thompson
Rutherford
Bohr
Experiments
Thompson, Rutherford, Millikan, Planck, Einstein
EMR Types: Radio, Ir, Visible, UV, X-Ray, Gamma
Emission Spectra

Electron Configurations

Shells, subshells, orbitals, shapes of orbitals
4 quantum numbers
s, p, d, f subshells (1s, 2p, 3d, 4f)
Identification of final subshell: eg. Au = $5d^{9}$

Periodic Table

Periods and Groups
Metals, Semimetals, Nonmetals
Alkali Metals, Alkaline Earth Metals, Halogens, Noble Gases, Transition Metals, Inner Transition Metals (Rare Earth metals / Lanthanides, Actinides)
Ionization Energy, trends
Atomic Radius, trends
Electronegativity, trends
Ions: reaching p^{6} configurations
Relative Sizes: Metal / Metal Ions. Nonmetals, NM ions

Ionic Bonds

Properties of Ionic Compounds
Dissolution in Water (Solvation)
Metals + Nonmetals

Covalent Bonding

Nonmetals / Nonmetals, Semimetals / Nonmetals
Orbital Overlap
Lewis Structures: Atoms and Compounds
3-dimenstional Shapes
Polarity (Electronegativity) bonds and molecules

Nuclear Chemistry

Quarks.
Four Forces in Nature
Types of Radiation (alpha, beta, gamma), equations, strength
Half Life
Nuclear Fission (power plants)
Nuclear Fusion (sun, thermonuclear WMD)