



Big Chem Semester Review



Although you may use your notes on the Semester Exam, there is insufficient time to look up very much. You MUST know your stuff for this exam!!!

Practice your notes in writing! Here are some things to be sure you know:

All Symbols and Valences and Formula Writing! Practice on the computer disk and in writing on the practice sheet. Practice Balancing Equations!

Practice in writing each type of chemical problem. For Example:

Find Atomic Mass	Density	Molecular Formula
Find Molecular Mass	Significant Digits	Hydrates
Get Moles	Find the mass of an atom	Problems using equations
From Mass	Find the mass of a molecule	Heat of Reaction
From number of atoms	Find Molarity of a solution	Enthalpy of Reaction
From number of molecules	Prepare a solution, g/liter	Force on Hemispheres
From no. of formula units	Percentage composition	Change °C to K
From Heat of Reaction	Empirical Formulas	Change mm of Hg to kPa

Terms: Be able to Define, Explain, and Provide Examples for these terms:

Historical Introduction	Carbon	Law of Conservation of Mass	Covalent (sharing)	Solids & Crystals
Natural Philosophy	Graphite	Law of Definite Proportions	Hydrogen (between O & H)	Solidification
Thales of Miletus	Diamond	Law of Multiple Proportions	Metallic	Sublimation
Democritus	Buckyballs, etc.	Law of Gay Lussac	(delocalized e ⁻)	Evaporation
Empedocleese	Solution	Faraday's Discovery	van der Waals (between molecules)	Unit Cell
Aristotle	Solute	Discovery of the Electron	Infra-Red Spectroscopy	Allotrope
Alchemy	Solvent	Properties of Electron	Molecular Motions	Hydroscopic
Friar Bacon	Physical Property	Charge-Mass Ratio	Translation	Deliquescent
Sir Francis Bacon	Chemical Property	Charge (Millikan Oil)	Rotation	Efflorescent
Robert Boyle	Physical Change	Mass of Electron	Vibration (3 modes)	Hydrate
John Dalton	Chemical Change	Ions & the Proton	Structure of Molecules	Dehydration
Lavoisier	Distillation	Mass Spectrograph	Linear (180°)	Anhydrous
Mendeleev	Fractional Distillation	Isotopes	Bent (>90°)	Desiccator
Chemistry	Chemical Symbol	X-Rays	Tigonal Planar (120°)	Viscosity
Matter	Chemical Formula	X-Ray spectroscopy	Pyramidal (104.5°)	Volatility
Energy	Valence	structure of crystal	Tetrahedral (109.5°)	Ionic crystal
Conservation Laws	Oxidation Number	Radioactivity	Polar Molecules	Covalent crystal
Mass	Molecular Formula	Size of Atom	Asymmetrical (dipoles)	Network crystal
Metric Prefixes	Empirical Formula	Size of Nucleus	Kinetic Theory	Metallic solid
Temperature	Structural Formula	Spectroscopy	Evidences (8).	Precipitation
Significant Digit	Formula Mass	Rutherford's Atom	Atmospheric Pressure	Regelation
Accuracy	Formula Unit	Photoelectric Effect	Duke of Tuscany	Liquids
Precision	The Mole	Ionization Energy	Torricelli's discovery	Vapor Pressure
Scientific Notation	Avogadro's Number	Electron Probability	Density of Air (1g/liter)	Boiling Point
Density	Molarity	Quantum Numbers	Atmospheric Pressure	Two ways to boil
Mixture	Percentage Composition	Orbitals	10 meters of H ₂ O	Charles's Law
Heterogeneous	Hydrate	Shapes of Orbitals	760 mm of Hg	Absolute Temp
Homogeneous	Overpopulation	Boxes & Dot structure	1 kg/cm ²	Melting Point
Element	Evidences for Reactions	The Periodic Table	101 kPa	Warming curve for H ₂ O
Atom	Types of Reactions	Arrangement of Elements	Magdeburg Hemispheres	Triple Point
Compound	Synthesis	Alkali Family	The Syphon	Heat of Fusion
Molecule	Decomposition	Alkaline Earth Family	The Brass Aspirator	Heat of Vaporization
Proton	Single Displacement	The Hologens	The Nasty Waitress	Surface Tension
Neutron	Double Displacement	The Noble Gases	Trick	Capillarity
Electron	Combustion (burn it)	The Octet Rule	Cans & 4-liter Jugs	Ducky
Atomic Mass Number	Mass-mass problems	The Spine Tingler	The Barometer	Humidity
Atomic Weight	Heat Calculations	Chemical Bonding	The Manometer	Psychrometer
Molecular Mass	Enthalpy δH	between atoms	States of Matter (4)	Gases
Isotope	Exothermic, -δH	Ionic (the rip-off)		Boyle's Law
Allotrope	Endothermic, +δH	Ionization Energy		Charles' Law
Oxygen	Activation Energy	Factors (5)		Dalton's Law of Pressure
Ozone	Factors of A.E.			STP
Sulfur	Catalyst			
Rhombic	Mass-Heat problems			
Monoclinic	Atomic Structure			
Amorphous				