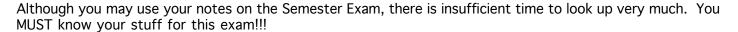
Big Chem Semester Review



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

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

Historical Introduction Natural Philosophy Thales of Miletus Democritus Empedoclese Aristotle Alchemy Friar Bacon Sir Francis Bacon Robert Boyle John Dalton Lavoisier Mendeleev Chemistry Matter Energy Conservation Laws Mass Metric Prefixes Temperature Significant Digit Accuracy Precision Scientific Notation Density Mixture Heterogeneous Homogeneous Element Atom Compound Molecule Proton Neutron Flectron Atomic Mass Number Atomic Weight Molecular Mass Isotope Allotrope Oxygen Ozone Sulfur Rhombic Monoclinic Amorphous

Diamond Buckyballs, etc. Solution Solute Solvent Physical Property **Chemical Property** Physical Change Chemical Change Distillation Fractional Distillation **Chemical Symbol** Chemical Formula Valence **Oxidation Number** Molecular Formula **Empirical Formula** Structural Formula Formula Mass Formula Unit The Mole Avogadro's Number Molarity Percentage Composition Hydrate Overpopulation **Evidences for Reactions** Types of Reactions Synthesis Decomposition Single Displacement **Double Displacement** Combustion (burn it) Mass-mass problems Heat Calculations Enthalpy δH Exothermic, -8H Endothermic, $+\delta H$ Activation Energy Factors of A.E. Catalyst Mass-Heat problems Atomic Structure

Carbon

Graphite

Law of Conservation of Mass Law of Definite Proportions Law of Multiple Proportions Law of Gay Lussac Faraday's Discovery Discovery of the Electron Properties of Electron Charge-Mass Ratio Charge (Millikan Oil) Mass of Electron lons & the Proton Mass Spectrograph Isotopes X-Ravs X-Ray spectroscopy structure of crystal Radioactivity Size of Atom Size of Nucleus Spectroscopy Rutherford's Atom Photoelectric Effect Ionization Energy Electron Probability Quantum Numbers Orbitals Shapes of Orbitals Boxes & Dot structure The Periodic Table Arrangement of Flements Alkali Family Alkaline Earth Family The Hologens The Noble Gases The Octet Rule The Spine Tingler Chemical Bonding between atoms lonic (the rip-off) Ionization Energy Factors (5)

Covalent (sharing) Hydrogen (between 0 & H) Metallic (delocalized e) van der Waals (between molecules) Infra-Red Spectroscopy Molecular Motions Translation Rotation Vibration (3 modes) Structure of Moleucles Linear (180°) Bent (>90°) **Tigonal Planar** (120°) Pyramidal (104.5°) Tetrahedral (109.5°) Polar Molecules Asymmetrical (dipoles) Kinetic Theory Evidences (8). Atmospheric Pressure Duke of Tuscany Torricelli's discovery Density of Air (1g/liter) Atmospheric Pressure 10 meters of H₂O 760 mm of Hg 1 kg/cm² 101 kPa Magdeburg Hemispheres The Syphon The Brass Aspirator The Nasty Waitress Trick Cans & 4-liter Jugs The Barometer The Manometer

States of Matter (4)

Solids & Crystals Solidification Sublimation Evaporation Unit Cell Allotrope Hydroscopic Deliquescent Efflorescent Hydrate Dehvdration Anhydrous Desiccator Viscosity Volatility Ionic crystal Covalent crystal Network crystal Metallic solid Precipitation Regelation Liquids Vapor Pressure **Boiling** Point Two ways to boil Charles's Law Absolute Temp Melting Point Warming curve for H₂O **Triple Point** Heat of Fusion Heat of Vaporization Surface Tension Capillarity Ducky Humidy Psychrometer Gases Boyle's Law Charles' Law Dalton's Law of Pressure STP

