Study Guide for Phy-Sci Chemistry Exam 2011-12
Chapters 1-8, pp. 4 – 279; (Most of chapter 7 is skipped)
Mr. Schulz

Topics – The exam is comprehensive from the first day of the second semester through May. Exam questions will be similar to questions from previous tests.

Whatever you do, work for the Lord with all your heart, give him your glory!

What is Physical Science?

Scientific Method of Problem Solving (5 steps)

SI Units; reasons for SI, meaningful measurements

Measuring

Unit Conversions and conversion factors

Significant Figures and Rounding

Read and interpret data tables and graphs

Calculate volume and density

Identify Lab Equipment

Composition of Matter
  Physical and Chemical Properties and Changes, what they are, examples illustrating each

States of Matter
  gas, liquid, solid, plasma; heat of fusion, heat of vaporization, specific heat

Gas Laws and Principles – I give you the law, you determine the correct application of it
  Boyle's, Charles', Archimedes', Pascal's, Bernoulli's, and Gay-Lussac's

Elements
  Atoms and their parts, Atomic Number, Atomic Mass, Mass Number, Symbols

Periodic Table (groups, periods, energy levels, properties of metals vs. nonmetals vs. metalloids. What are transuranium, transition metals, names of groups or periods, lanthanoids, actinoids, coinage, and iron triad elements?)

Chemical bonds – how they form and what their properties are
  covalent, ionic, metallic, hydrogen

Law of conservation of mass

Chemical stability

Types of molecules and ions
  diatomic, polar, non-polar, polyatomic, isomers, isotopes

Compounds – what they are, how they form

Chemical formulas and names
    using oxidation numbers determine formulas and names of ionic & covalent compounds

Hydrocarbons – identify structural formulas and properties
    unsaturated (alkenes and alkynes) vs. saturated (alkanes)
    substituted (alcohols, carboxylic acids)

Organic and Biological Compounds
    benzene rings, polymers, nucleic acids, proteins, amino acids, carbohydrates, lipids

Chemical Reactions
    combustion, synthesis, decomposition, single and double displacement; endothermic vs.
    exothermic, catalysts and inhibitors, redox reactions, Le Châtelier's principle

Acids and Bases, pH, salts; neutralization, their properties and characteristics

SI Units

| length | mass | temperature | time | volume |
| density | force | pressure | energy | specific heat |

SI Prefixes

nano-

micro-

milli-

Equations – will be provided

$$D = \frac{m}{V} \qquad P = \frac{F}{A} \qquad Q = m \cdot \Delta T \cdot C_p \qquad F_2 = \frac{F_1 \cdot A_2}{A_1}$$

centi-

$$Q = m \cdot H \ of \ F \qquad Q = m \cdot H \ of \ V$$

kilo-

mega-

giga-

Vocabulary
physical science
scientific law
theory
hypothesis
control variable
independent variable
dependent variable
experiment
accuracy
precision
mass
volume
density
matter
element
compound
molecule
homogeneous

heterogeneous
mixture
physical property
physical change
chemical property
chemical change
sublimation
melting
condensation
evaporation
freezing
vaporization
buoyant force
viscosity
amorphous
electron
neutron
proton
nucleus
isotope
valence electron
period
group
atomic mass
atomic number
mass number
Mendeleev
alkalis
alkali earths
transition elements
semi-conductors
halogens
noble gases
actinoids
lanthanoids
iron triad
coinage metals
metallic bond
hydrogen bond
covalent bond
ionic bond
ion
anion
cation
mole

Avogadro's Number
oxidation number
nonpolar molecule
polar molecule
polyatomic ion
diatomic molecule
BrINClHOF twins
hydrate
anhydrous
hydrocarbon
organic
isomer
monomer
polymer
substituted hydrocarbon
alcohol (hydroxyl)
carboxylic acid
aromatic ring
carbohydrate
amino acid
protein
lipid
nucleic acid
aqueous
reaction
endothermic
exothermic
catalyst
enzyme
inhibitor
precipitate
equilibrium
oxidation
reduction
acid
base
hydronium ion
hydroxide ion
pH
salt
neutralization
indicator