

Study Guide for Phy-Sci Chemistry Exam 2011

Chapters 1-5, pp. 4 - 177

Mr. Schulz

Topics – The exam is comprehensive from the first day of school through mid-December. Exam questions will be similar to questions from previous tests. Exam questions from chapter 5 will be new as we did not have a previous test on this material.

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

SI Units

length	mass	temperature	time	volume
density	force	pressure	energy	specific heat

SI Prefixes

nano-
micro-
milli-
centi-
kilo-
mega-
giga-

Equations – will be provided

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

$$Q = m \cdot H \text{ of } F \quad Q = m \cdot H \text{ of } V$$

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
BrINCIHOF twins
hydrate
anhydrous
hydrocarbon
organic
isomer
monomer
polymer
substituted hydrocarbon
alcohol (hydroxyl)
carboxylic acid
aromatic ring
carbohydrate
amino acid
protein
enzyme
lipid
nucleic acid