

BRING TO CLASS ON EXAM DAY: Scan-Tron Form 883, #2 pencil, and eraser

Material Covered on Exam:

Chemistry: assigned reading for Unit 2

Lab Manual: Experiments 4, 5

Exercises 4, 5

A. Review Exam 1 material as it applies to this unit.

B. Atomic Structure

1. Know the mass, charge, symbol and location in the atom of the fundamental subatomic particles: proton, neutron, electron
2. Given the atomic number and mass number of an element, be able to diagram the atom showing the number and location of protons and neutrons and showing the electrons in their proper shells.
3. Given diagrams of atoms or ions:
  - a. Recognize which are atoms or ions, which are metals or non-metals, and which are isotopes of the same element.
  - b. Determine their atomic numbers, atomic masses, mass numbers, and the number of valence electrons.
4. Electron Dots - Be able to draw:
  - a. The electron dot symbols for atoms of any of the "A" group elements.
  - c. The electron dot structures for molecules of diatomic elements or any of the following compounds:  $\text{H}_2\text{O}$ ,  $\text{CO}_2$ ,  $\text{NH}_3$ ,  $\text{CH}_4$ ,  $\text{CCl}_4$ .

*This material is included in Unit 2 but will not be on Exam 2.*

5. Nuclear Chemistry:
  - a. Know the symbols for and the properties of alpha particles, beta particles, and gamma rays.
  - b. Know the reason for alpha decay and beta decay and the changes in mass number and atomic number that occur as a result of each type of decay.
  - c. Be able to predict the products of alpha or beta decay of a given radioisotope.
  - d. Be able to do simple half-life calculations.
  - e. Know the meanings of nuclear fission and nuclear fusion.

C. Compounds

1. Recognize from its formula or name whether a given substance is covalent, salt, acid, or base.
2. Nomenclature: Given the name, write the formula, and vice versa, for the following:
  - (a) covalent compounds
  - (b) salts
  - (c) acids
  - (d) bases (metal hydroxides)
  - (e) polyatomic ions
  - (f) monatomic ions
3. Given the formula for a compound be able to determine which ions are present (if any) and how many of each.

#### D. Moles

1. Know the difference between mass in amu and mass in grams.
2. Given the formula for a compound, be able to compute its molar mass.
3. Use the molar mass of an element or compound to make conversions between mass and moles.

#### E. Inter- and Intraparticle Forces

1. Electronegativity
  - a. Know what electronegativity is.
  - b. Know where on the periodic chart you would find elements with high versus low electronegativity values.
  - c. Know the relationship between difference in electronegativities of bonding atoms and the type of bond formed between them.
2. Know the difference between polar and nonpolar molecules.
3. Know the names of the seven types of intra- & interparticle forces, their relative strengths, and the types of particles they hold together.