

Chemistry Fall Final Review 2012-2013*Alchemy Unit*

- Using the periodic table, where are the metals and nonmetals? What is hydrogen?
- Where are the alkali, alkaline earth, transition metals, halogens, and noble gases?
- On the periodic table, what are the trends for atomic mass atomic numbers, atomic radii (size), and reactivity as you move across a period and down a group?
- Draw a Bohr atomic model of lithium. Label the parts of the atom and their charges.
 - Which part of the atom is the heaviest and lightest?
- What is the atomic number and atomic mass of phosphorus and strontium?
 - What is the difference between atomic number and atomic mass?
- What is an isotope? Name two possible isotopes for carbon and potassium. Use isotope symbol.
- Write the equation for the alpha decay of astatine -213.
 - Write the equation for the beta decay of neptunium -239.
 - What is more harmful alpha particles, beta particles, or gamma rays?
- What are valence electrons? Which subshells are included in valence?
 - How many valence electrons do Mg, S, and Al have?
- What elements with the following electron configurations of
 - $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^1$
 - $1s^2 2s^2 2p^6 3s^2 3p^4$

10. Fill in table.

	Type of Bond?	Conducts Electricity?	Dissolves in water?	Conducts electricity when dissolved?
Metals				
Metal and Nonmetal				
Nonmetals (hard solids)				
Nonmetals (l, g, soft solids)				

- What are ions? What are cations and anions?
- In ionic bonds, metals tend to lose electrons and nonmetals gain electrons. What happens to these elements to achieve noble electron configuration? What charge will the element form?
 - oxygen
 - chlorine
 - sodium
 - barium
- What is the chemical formula and name of the compound formed when beryllium reacts with fluorine?
 - What is the chemical formula and name of the compound formed when potassium reacts with sulfur?
- What are the chemical formula and charge for the following polyatomic ions?
 - sulfate
 - hydroxide
 - nitrate

Smells Unit

15. What are isomers? Draw the three isomers for C_3H_9N .
16. What is the HONC1234 and Octet rule? Which molecules **below** obey the Octet rule? Draw the Lewis Dot structures for the following molecules.
a). CF_3 b). PCl_2 c). OCl_2 d). SiI_4
17. What are the different functional groups, the smells associated for each, and their common names endings?
18. What is an electron domain? What is the difference between lone pairs and bonded electron pairs?
19. Fill in table.

Molecule	Lewis Dot Structure	Structural Formula and Name of Shape	Lone pairs on central atom	Bonded pairs on central atom
CO_2				
$SeCl_2$				
NH_3				
CH_4				
CH_2O				

20. What is a catalyst? What does it do?
21. Write the molecular formula, structural formula, Lewis Dot structure, and ball-and-stick formula for water.
22. What are the different characteristics between a polar vs. nonpolar molecules? (ex: dissolve in water, attraction to a negatively charged wand, on wax paper).
23. How do you use the electronegativity values chart to determine nonpolar covalent, polar covalent, and ionic bonds? What is happening to the electrons in these different bonds?
24. Determine type of bond between these atoms: Cl-Cl, As-H, Ca-O, P-I, K-Cl, and F-Si
25. Are the following molecules polar or nonpolar molecules? Explain a). SiF_4 b). PI_3
26. What are the van der Waals forces: hydrogen bonding, dipole-dipole forces, and London Dispersion forces?

