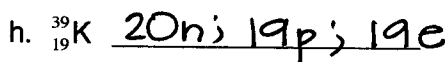
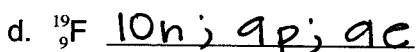
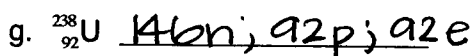
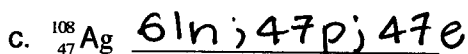
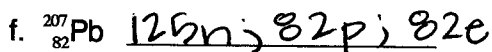
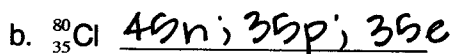
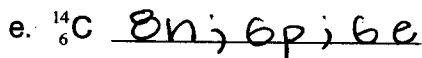
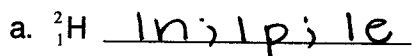


## Unit 4 Activity Sheet

Dr. Scharberg

A. Determine the number of neutrons, electrons, and protons in each atom listed below. let  $n$  = neutrons;  $e$  = electrons;  $p$  = protons



B. Calculate the molecular weight of each of the following compounds and the percentage of each element present in these compounds. USE A PIECE OF SCRATCH PAPER!!  $\textcircled{*}$  USE PERIODIC TABLE

$$\text{ex: } 23.0\text{g (Na)} + 16.0\text{g (O)} + 1.00\text{g (H)} = 40.0\text{g/mol}$$

a.  $\text{NaOH} = 40.0\text{g/mol}$

b.  $\text{CaSO}_4 = 136.0\text{g/mol}$

c.  $\text{Na}_3\text{PO}_4 = 164.0\text{g/mol}$

d.  $\text{KNO}_3 = 101.0\text{g/mol}$

e.  $\text{C}_6\text{H}_{12}\text{O}_6 = 180.0\text{g/mol}$

f.  $\text{KI} = 166.0\text{g/mol}$

g.  $\text{CuO} = 79.5\text{g/mol}$

h.  $\text{HNO}_3 = 63.0\text{g/mol}$

i.  $\text{NaCl} = 58.5\text{g/mol}$

## C. Practice Problems.

1. The number of neutrons in an atom equals

- the number of electrons
- the number of protons
- the atomic number
- the atomic weight
- $\textcircled{e}$  the atomic mass minus the atomic number

2. The molecular formula of a compound which contains 40% Si and 60% N is

- $\text{Si}_3\text{N}_4$
- $\text{SiN}_2$
- $\textcircled{c}$   $\text{SiN}_3$
- $\text{Si}_2\text{N}$
- $\text{SiN}_4$

solution: take 100g sample; 40.0g Si & 60.0g N

$$\begin{array}{l} \# \text{ of} \\ \text{moles} \end{array} \rightarrow \underline{\text{Si}} : \frac{40.0\text{g}}{28.1\text{g/mol}} = 1.42 \text{ mole Si} \quad \underline{\text{N}} : \frac{60.0\text{g}}{14.0\text{g/mol}} = 4.29 \text{ moles of N}$$

$$\text{set up ratio: } \frac{4.29 \text{ moles of N}}{1.42 \text{ moles of Si}} = \frac{3 \text{ moles of N}}{1 \text{ mole of Si}} \therefore \text{SiN}_3$$

3. After an atom has lost or gained electrons it is referred to as C.
- a. an isotope  
b. a molecule  
c. an ion  
d. a neutron  
e. a pure substance

4. An ion species that is composed of 26 protons, 29 neutrons, and 24 electrons would probably be:

- a.  $\text{Cr}^{+2}$   
b.  $\text{Fe}^{+3}$   
c.  $\text{Al}^{+3}$

- d.  $\text{Mg}^{+2}$   
e.  $\text{Fe}^{+2}$

→ tells you the atomic # and then you can determine the element from Periodic Table  
→ tells you whether its an ion or neutral element.

5. Which of the following is the best explanation of why chlorine has an atomic weight of 35.5 amu rather than 35 or 36?

- a. Chlorine is a very active non-metal.  
b. One atom of chlorine weighs 35.5 amu when compared with the carbon-12 isotope.  
c. Chlorine is a diatomic molecule.  
d. No chlorine atom has a mass of 35 amu.  
e. the average weight of all naturally occurring chlorine atoms is 35.5 amu.

Know isotope definition

6. Washing soda is a hydrate with a formula is  $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ . The theoretical percent water is: (see lab manual for solution)

- a. 62.9%    b. over 65%    c. less than 35%    d. 37.1%    e. none of these

#### D. More Practice Problems.

In the blank next to each phrase in Column A, write the letter of the word in Column B which is most closely associated with it.

##### Column A

##### Column B

- |          |  |                  |
|----------|--|------------------|
| <u>D</u> | 1. The number of protons in the nucleus of an atom.  | A. neutron       |
| <u>C</u> | 2. The average relative weight of the atoms of an element.   | B. isotope       |
| <u>E</u> | 3. A negatively charged particle found in an atom.   | C. atomic weight |
| <u>B</u> | 4. One of two or more forms of atoms with the same atomic number but with different atomic masses. | D. atomic number |
| <u>A</u> | 5. A neutral particle found in the nucleus of an atom.   | E. electron      |

Know these definitions!