Chemistry 103 Workshop – Spring 2015

Professor Tamargo -- Liaison Stephin Jose

Chapter 2-3 (Matter: It's Properties & Measurement) Worksheet

Name: _____ Section:_____

Workshop Leader _____

1.When an iron object rusts, its mass increases. When a match burns, its mass decreases. Do these observations violate the law of conservation of mass? Explain.

2.What is Avogadro's Constant? What does this constant mean/why is it used?

3. A 0.406g sample of magnesium reacts with oxygen, producing 0.674 g of magnesium oxide as the only product. What mass of oxygen was consumed in the reaction?

4.

15. The following data were obtained for compounds of nitrogen and hydrogen:

Compound	Mass of Nitrogen, g	Mass of Hydrogen, g
A	0.500	0.108
B	1.000	0.0720
C	0.750	0.108

(a) Show that these data are consistent with the law of multiple proportions.
(b) If the formula of compound B is N_2H_2, what are the formulas of compounds A and C?

5.Arrange the following species in order of increasing

$^{112}_{50}Sn$ $^{40}_{18}Ar$ $^{122}_{52}Te$ $^{59}_{29}Cu$ $^{120}_{48}Cd$ $^{58}_{27}Co$ $^{39}_{19}K$

a. Number of electrons

b. Number of neutrons

c. Mass

6. Refer to the periodic table and identify

a. The element that is in group 14 and the fourth period

b. One element similar to and one unlike sulfur

c. The alkali metal in the fifth period

d. The halogen element in the sixth period

e. The lement that is in group 11 and the sixth period

f. An element with atomic number greater than 50 that has properties similar to the element with atomic number 18

g. The group number of an element E that forms an ion E^{2-}

h. An element M that you would expect to form ion M^{3+}

7. Medical experts generally believe a level 30 μg Pb per deciliter of blood poses a significant health risk. Express this level
    a. In the unit mol Pb/L

    b. As the number of Pb atoms per milliliter of blood

8. Calculate the total number of
    a. Atoms in one molecule of trinitrotoluene (TNT), $CH_3C_6H_2(NO_2)_3$

    b. Atoms in 0.00102 mol $CH_3(CH_2)_4CH_2OH$

    c. F atoms in 12.15 mol $C_2HBrClF_3$

9. What's the difference between molecular formula, structural formula, empirical formula, condensed structural formula, and line angle formula?
   Represent acetic acid (CH_3COOH) using each type of formula.

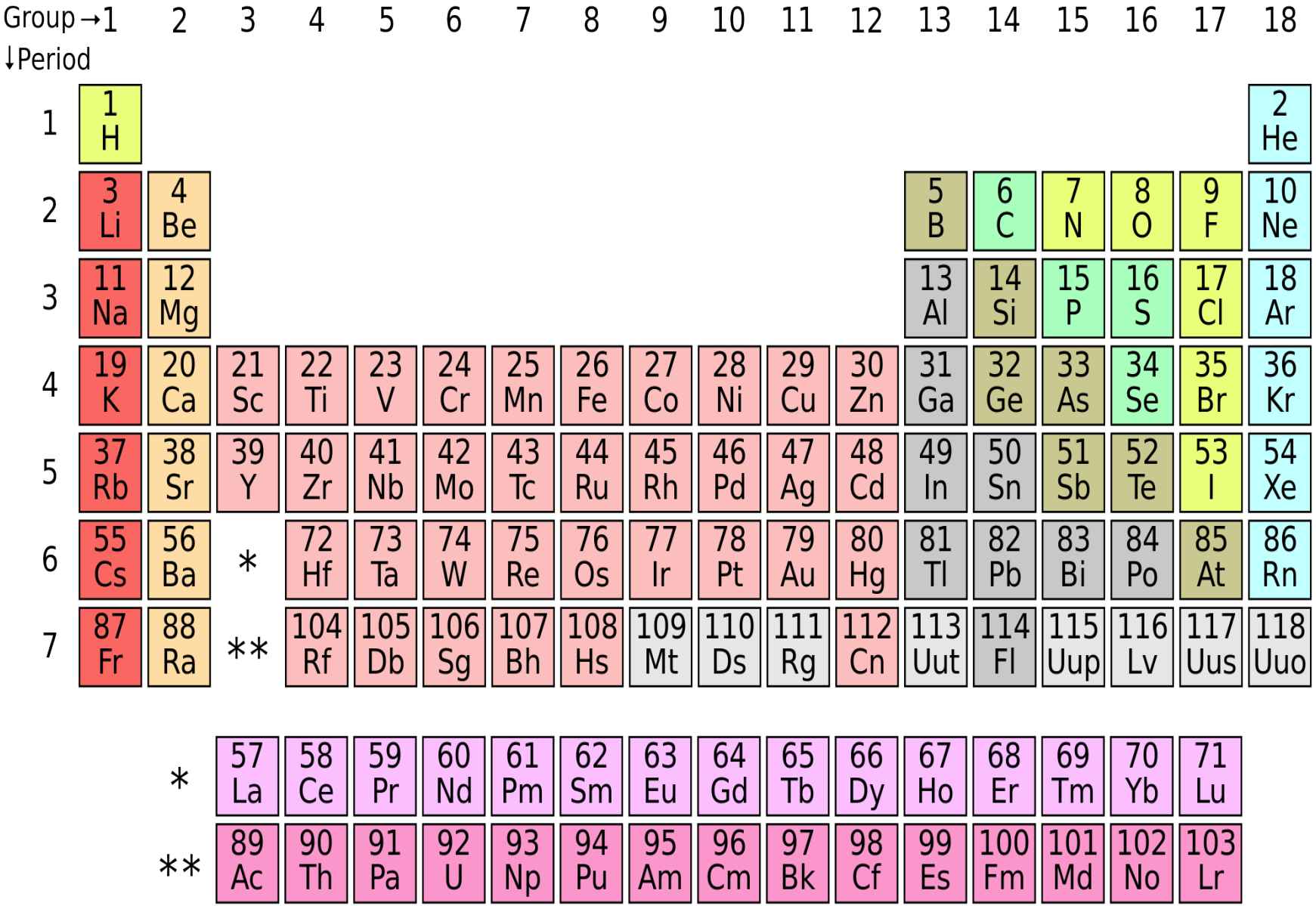
10. Which two elements should a compound consist of to be an organic compound?

11. Define both formula mass and molecular mass. What is the different between the two terms?

12. Find the formula mass of magnesium chloride.

13. What are the different functional groups that can attach to an organic compound? How do they change the naming of the compound?

14. What are the pre-fixes that indicate how many carbons are in simple organic molecules?


Group →1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
↓Period
1 1 H 2 He
2 3 Li 4 Be 5 B 6 C 7 N 8 O 9 F 10 Ne
3 11 Na 12 Mg 13 Al 14 Si 15 P 16 S 17 Cl 18 Ar
4 19 K 20 Ca 21 Sc 22 Ti 23 V 24 Cr 25 Mn 26 Fe 27 Co 28 Ni 29 Cu 30 Zn 31 Ga 32 Ge 33 As 34 Se 35 Br 36 Kr
5 37 Rb 38 Sr 39 Y 40 Zr 41 Nb 42 Mo 43 Tc 44 Ru 45 Rh 46 Pd 47 Ag 48 Cd 49 In 50 Sn 51 Sb 52 Te 53 I 54 Xe
6 55 Cs 56 Ba * 72 Hf 73 Ta 74 W 75 Re 76 Os 77 Ir 78 Pt 79 Au 80 Hg 81 Tl 82 Pb 83 Bi 84 Po 85 At 86 Rn
7 87 Fr 88 Ra ** 104 Rf 105 Db 106 Sg 107 Bh 108 Hs 109 Mt 110 Ds 111 Rg 112 Cn 113 Uut 114 Fl 115 Uup 116 Lv 117 Uus 118 Uuo
* 57 La 58 Ce 59 Pr 60 Nd 61 Pm 62 Sm 63 Eu 64 Gd 65 Tb 66 Dy 67 Ho 68 Er 69 Tm 70 Yb 71 Lu
** 89 Ac 90 Th 91 Pa 92 U 93 Np 94 Pu 95 Am 96 Cm 97 Bk 98 Cf 99 Es 100 Fm 101 Md 102 No 103 Lr