Dougherty Valley HS Chemistry
Reactions – Molar Mass & Molar Conversion Review

Worksheet #5

Name: **Period:** **Seat#:**

Calculate the following molar masses. Make sure your answers have units! Show work for #1-4:

1) Cl_2	**2)** KOH
3) $FeCl_3$	**4)** $(NH_4)_2SO_4$

For #6-14, do them in your *calculator*. You can show your work if needed, but the goal is to not have to. Make sure your answers have units!

5) SO_2	**6)** BF_3	**7)** UF_6	**8)** CCl_2F_2	**9)** $Mg(OH)_2$
10) H_3PO_4	**11)** CH_3COOH	**12)** $Pb(NO_3)_2$	**13)** $Ga_2(SO_3)_3$	**14)** $C_6H_{12}O_6$
15) Prozac, $C_{17}H_{18}F_3NO$ (a widely used antidepressant that inhibits the uptake of serotonin by the brain.)				

For the remaining problems on this worksheet, show all work using dimensional analysis. You should only have *one* dimensional analysis line set up per problem. You may use multiple conversion factors per line set up, but you should only be pressing enter one time! Include units, show canceling units, get an answer, and units on your answer.

Calculate how many moles are in the following masses:

16) 125 g of H_2SO_4

17) 35 g of $CuSO_4(H_2O)_5$

Calculate the mass (in grams) of the following number of moles:

18) 0.5 mole of H_2SO_4

19) 3.2 mol of $CuSO_4(H_2O)_5$

Calculate how many atoms are in the following number of moles. Put your answer in scientific notation:

20) 2 moles

21) 15 moles

22) 0.35 moles

Calculate how many moles are in the following number of atoms.

23) 1.204×10^{24}

24) 1.5×10^{20}

25) 7.5×10^{19}

26) How many molecules of water are in a standard water bottle (500mL)? Remember the density of water is a conversion factor (1mL=1g).

27) Which has more molecules: one teaspoon of salt (NaCl - 6 grams) or one teaspoon of sugar ($C_{12}H_{22}O_{11}$ – 4.5 grams)

28) How many atoms are in one teaspoon of salt (atoms, not molecules!)? One teaspoon of salt weighs 6 grams.

29) One can of regular Coca Cola has 39 grams of sugar ($C_{12}H_{22}O_{11}$). How many molecules of sugar are you drinking?

Under "standard" conditions (0°C temperature, and 1atm of pressure) one mole of a gas will take up 22.4 L of space, regardless of which gas it is (unless it is a "non-ideal" gas which we aren't worried about). Using this "molar volume" as a conversion factor, do the following problems as dimensional analysis problems. Same requirements apply as in the previous questions on this worksheet. ($\frac{1mol}{22.4L}$)

Calculate how many moles are in the following number of liters.

30) 10.9 liters

Calculate how many atoms are in the following number of liters.

31) 0.75 liters

Calculate how many liters the following number of atoms would take up.

32) 4.6×10^{35} atoms

Calculate the mass of the following.

33) 35 liters of Cl_2 gas

Calculate the volume of the following.

34) 40 kg of water vapor gas