Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_\_

Mesivta Chem II Summer Work

Answer the following questions. Show all of your work and be sure that your answers have correct units.

I think that you should be at least somewhat familiar with most of this. If you can do something right away, that’s great. If you know that you “were” able to do a problem at some point in the past, try looking for a sample problem to see if that jogs your memory. If it does, great. If it doesn’t, that’s okay.

Be sure to go all the way through this list. You may not remember something in #4 but still feel confident with #6 (etc.)

#10 is the most important question on this sheet (for me as your teacher) but you can’t answer it until you’ve been through the rest of the sheet.

1. Determine the molar mass of each of the following:
2. Propanol
3. Barium acetate
4. Dinitrogen pentoxide
5. For each example below, determine the type of reaction described, then write and balance the reaction:
6. Copper is added to silver nitrate
7. Butane burns
8. Calcium carbonate is heated
9. Aluminum reacts with chlorine
10. Barium nitrite is mixed with potassium phosphate (also, write the net ionic equation for this reaction)
11. Solve the following problems:
12. What is the mass of 3.98 moles of lithium sulfate?
13. How many molecules of ethanol can be found in 165.9 mL of a 0.445 M solution?
14. Solve the following problems:
15. If 13.9 g of C2H6 burns, how many grams of water are formed?
16. A student burns 100.0 g of C2H6 and collects the CO2 produced. If they collect only 150.0 g of carbon dioxide, what is the percent yield?
17. Solve the following problems:
18. What is the percent composition of ammonium oxalate, (NH4)2C2O4?
19. A compound is 40.00% C, 53.29% O, and 6.71% H. What is the empirical formula?
20. A different compound has the empirical formula C2HBr and a molar mass of 314.8 g/mol. What is the molecular formula?
21. For each molecule in the table below, do the following
22. Draw the Lewis Dot Structure
23. Determine the structure and shape (the electron geometry and molecular geometry) of each central atom
24. Show the polarity on each bond
25. Determine the overall molecule is polar
26. Name the attraction that holds the compound together in the liquid phase
27. Name the attraction that this compound has with water molecules

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| C2H6 | C3H7OH | NH3 | CO2 |

1. Answer the following questions based on the behavior of gases:
2. When the temperature of a gas is increased, what happens to the pressure and why?
3. When the volume of a container is increased, what happens to the pressure and why?
4. A weather balloon with a volume of 11,500 L at 1.07 atm and 18.3oC is released. Later, it reaches an altitude where the pressure is only 495 mm Hg and the temperature is -17.5oC. What is the volume of the balloon at that point?
5. A 17.5 L scuba tank is filled with oxygen at 19.5 atm and 25.8oC. How many grams of oxygen are in the tank?
6. Answer the following questions on heat:
7. What is heat, and how is it different from temperature?
8. If 350 g of water at 21.7oC gains 750 J of heat, what will the new temperature be?
9. A 13.8 g piece of metal at 98.7oC is dropped into 200.0 g of water at 11.9oC. The final temperature is 14.8oC. What is the specific heat of the metal? (The specific heat of water is 4.184 J/g⋅oC)
10. Use bond energies to determine the heat of the reaction below:

C3H6 + Cl2 → C3H6Cl2

1. Answer the following questions about acids and bases
2. Write the reaction that occurs when HBr is placed in water. Label the acids, bases and conjugate pairs in the reaction.
3. Write the neutralization reaction that occurs between NaOH and HCl.
4. If it requires 31.8 mL of a 0.511 M solution of NaOH to titrate 20.00 mL of an acid solution, what is the concentration of the acid?
5. Go back and highlight the following
6. Things you feel pretty OK about
7. Things you sort-of remember, but needed some review
8. Things you know you should remember, but really don’t
9. Things you are certain that you’ve never seen before