

Name\_\_\_\_\_

## Chemistry Final Exam - Problem Section

- 2 pts per problem
- Please show all work on this form and **circle your answers!!**
- Be sure to follow significant figure rules for problems unless noted on the problem
- Good luck!!!

1. Calculate the amount of heat ( $\Delta H$ ) required to raise the temperature of 50.0g of water from 10.0°C to 25.0°C.

2. Calculate: 
$$\frac{(3.56)(7.5403 \times 10^{-13})}{(0.0032)(5.00 \times 10^8)} =$$

3. Convert the following:

a. 4550 kJ = ? J

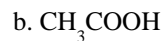
b. 54 °C = ? K

4. Convert the following:

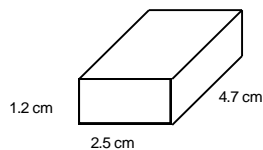
a.  $1.054 \times 10^8$  mm = ? km

b. 982 Torr = ? kPa

5. Give the Lewis Structure for the following molecular substances:



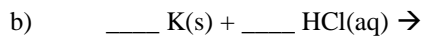
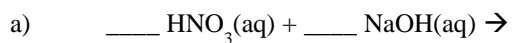
Name \_\_\_\_\_



6.

If the above object has a mass of 135.45g, what is its density?

7. Complete and balance the following reactions:



8. What is the pH of a solution in which  $[\text{H}^+] = 3.64 \times 10^{-3}\text{M}$ ?

9. What is the pH of a solution in which you dissolve 3.00g of  $\text{HNO}_3$  in 0.500 L of water?

10. What is the formula mass of copper(II) nitrate:  $\text{Cu}(\text{NO}_3)_2$ ?

11. What is the percent composition of  $\text{MgO}$ ?

\_\_\_\_\_ % Mg    \_\_\_\_\_ % O

Name\_\_\_\_\_

12. If you have a syringe which shows a volume of 12.0 mL under 0.97 atm of pressure, what will the volume be under 1.46 atm of pressure? Assume temperature remains constant.

13. What is the concentration (in M) of a solution in which you dissolve 75.0 g of NaBr in 500 mL of water?

14. For the following equilibrium:  $\text{N}_2(\text{g}) + 3 \text{H}_2(\text{g}) \rightleftharpoons 2 \text{NH}_3(\text{g})$

a. What is the mass-action expression?

b. What is  $K_{\text{eq}}$  if  $[\text{NH}_3] = 0.00359\text{M}$ ,  $[\text{H}_2] = 0.222 \text{ M}$ , and  $[\text{N}_2] = 0.104 \text{ M}$ ?

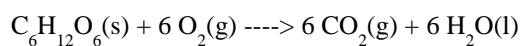
15. To what volume must you dilute 50.0 mL of a 4.00 M NaOH solution to make a 1.50 M solution?

16. How much do  $3.45 \times 10^{22}$  atoms of gold (Au) weigh?

Name \_\_\_\_\_

17. How many grams of potassium hydroxide (KOH) do you need to make 0.500L of a 2.00 M solution?

Use the following reaction to answer questions 18 & 19:

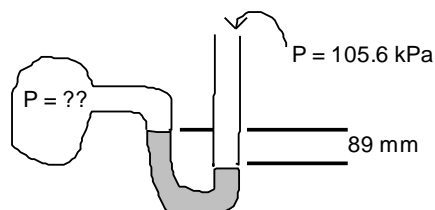


18. If you produced 0.682 mole of carbon dioxide, how many moles of glucose ( $\text{C}_6\text{H}_{12}\text{O}_6$ ) did you begin with?

19. If you react 25.0g of glucose ( $\text{C}_6\text{H}_{12}\text{O}_6$ ), how many grams of water would you expect?

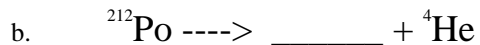
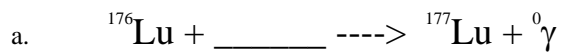
20. If you have a balloon which contains 3.42L of helium gas under 3.45 atm of pressure at a temperature of  $255^\circ\text{C}$ , what will the volume be if you move the balloon to an area which is at 273 K and 1.00 atm of pressure?

21. What is the pressure of the gas in the closed container?

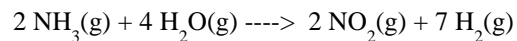


Name\_\_\_\_\_

22. Complete the nuclear equations below:



23. Find the change in enthalpy ( $\Delta H$ ) for the following reaction:



24. If you were to titrate an unknown vinegar solution with a standard 0.600 M NaOH solution, and it takes an average of 54.8 drops of NaOH to neutralize exactly 40 drops of vinegar, what is the molarity of the vinegar?

25. What is the concentration (in % by mass) if you dissolve 50.0 g of NaCl in 150 mL of water?

\* assume the density of the water is 1.00 g/mL