Chemistry 2014
Spring Final Review

Instructions: Please complete all of these questions on a separate piece of paper to the best of your ability. The more thorough your answers, the better they are to study from. A true test of your knowledge on these topics is if you can answer these questions without looking at any references. For **full credit** you must have **complete sentence answers** wherever possible.

1. Explain the conservation of mass. How does it relate to chemical equations?
2. How do you balance equations?
3. What do the small lowercase letters after the chemical symbols in equations mean?
4. How can you tell if an equation is balanced?
5. List the four main types of reactions and write the generalized reaction for each of them.
6. What are SI units?
7. What are the SI units for mass, length, volume, and time?
8. What is the formula for density?
9. Calculate the density of a solid that has a mass of 23.5g and takes up a volume of 38.5ml
10. What is a mole of an element?
11. What is Avagadro's number?
12. How do you calculate molar mass? What are the units?
13. How many moles of potassium are in 78.2g of potassium?
14. What do the coefficients of a chemical equation represent?
15. Explain how the mole ratio of a chemical equation is useful in relating the amount of substances in the chemical equation to each other.
16. What are the chemical formulas for methane and ammonia.
17. How many moles of NH_3 will be produced from the reaction of 3 Moles of H_2 in the following equation if N_2 is in excess? $N_2 + H_2 \rightarrow NH_3$
18. How many grams of O_2 are needed to react completely with 25g of H_2 in the following equation? $H_2 + O_2 \rightarrow 2H_2O$
19. How much water was produced in the above equation?
20. What is the molar mass of $MgCl_2$? How many moles are in 54g of $MgCl_2$? How many molecules is that?
21.
22. How does a limiting reactant affect your reaction?
23. How does an excess reactant affect your reaction?
24. How do you calculate the limiting reactant?
25. Explain the difference between theoretical yield and actual yield.
26. What is the formula for percent yield?
27. How do intermolecular forces differ from intra-molecular forces?
28. List the different intermolecular forces from strongest to weakest
29. How do intermolecular forces affect boiling point and melting point of a substance?
30. What is an electrolyte?

31. How do you tell the difference between a molecular substance and a ionic substance?
32. What is a Hydronium ion? How is it different from a Hydrogen ion?
33. What is a Hydroxide ion?
34. List the properties of acids and bases.
35. What happens when an acid mixes with a base?
36. What is the difference between a strong acid and a weak acid?
37. What is the difference between a strong base and a weak base?
38. On the pH scale, what is acidic? What is basic(alkaline)? What is neutral?
39. What does pH measure?
40. What is the difference between a highly concentrated acid and a strong acid?
41. Define a solution.
42. What is a solvent? What is a solute? Which one is found in the greatest quantity in the solution?
43. Define solubility
44. Explain the difference between saturated, unsaturated and supersaturated solutions.
45. What is meant by the phrase "Like dissolves like?"
46. What factor affects the solubility of a substance in a liquid? Why?
47. What factors affect the rate at which a solid will dissolve in a liquid? Why?
48. In your own words describe what the concentration of a solution expresses.
49. What is the formula for percent composition? What is the percent composition of NaCl in a 3000kg solution with 3 kg of NaCl?
50. Write the formula for calculating Molarity. What is the concentration of a solution with 2.3 Moles of NaCl in 5 L of water?
51. What is the density of water? How much does 232ml of water weigh in grams?
52. How is the freezing point of water affected when you add salt to the water?
53. What is the difference between Molarity (*M*) and Molality (*m*).
54. If I have 0.250L of water and 10 g of salt what is the concentration in g/L
55. Explain what happens to the energy of the system and the energy of the surroundings in exothermic as well as endothermic reactions.
56. List all six of the phase changes and whether they are exothermic or endothermic.
57. What is the definition of specific heat?
58. What happens to the energy when a substance is changing phase and not increasing in temperature?
59. What happens on the molecular level if something warm comes in contact with something that is colder?
60. How do you convert from Celsius to Kelvin? Convert 23°C to K
61. Explain how the kinetic energy of particles relates to the temperature.
62. What method do we use to measure energy?
63. How is energy different than temperature?
64. What are the two different units of energy that we used in this class? How do you convert from one to the other?
65. What is the formula for calculating energy from a calorimeter?
66. What is a thermochemical equation?
67. What is ΔH and what does it mean if it is negative?