HONORS CHEMISTRY
1ST SEMESTER EXAM REVIEW

The following is a list of objectives that you should have accomplished this semester in Honors Chemistry. You should be able to answer each one before you take your exam.

BONUS: YOU MAY RECEIVE **1/5** POINT BONUS ON YOUR EXAM FOR EACH OBJECTIVE THAT IS ANSWERED COMPLETELY AND CORRECTLY AND TURNED IN BY THE DAY OF YOUR EXAM. You are encouraged to answer all of the objectives to adequately study for the exam; however, a maximum of **50** OBJECTIVES will count for extra credit.

USE AT LEAST 1/2 OF A PAGE TO ANSWER EACH OBJECTIVE (leave that much space, even if it does not need that much room). Begin the next question either half way down the page or at the beginning of the next page. DO NOT ANSWER MORE THAN TWO OBJECTIVES PER PAGE. Write on the FRONT AND BACK of the page. Also, put your name and class period on the top right corner of each page.

YOU CANNOT COPY ANYONE ELSE'S ANSWERS **(NO ONE'S - NOT EVEN YOUR LAB PARTNER'S)**, WRITTEN OR ORAL, FOR ANY OBJECTIVE. If you have done so, or if you know of anyone who has done so, you are obligated to tell me immediately. Your honor is worth more than ten points extra credit!

1. Describe at least 10 lab safety rules.
2. Describe the use of at least 10 pieces of laboratory equipment.
3. Draw and label a diagram showing the proper method of (A) boiling a liquid (B)filtering a liquid (C) heating a substance intensely.
4. Distinguish between qualitative and quantitative observations, and intensive and extensive observations and give two examples of each. (eight examples in all).
5. For SI prefixes from tera to nano, know prefix, unit abbreviation, and exponential factor. Also know how many there are in one of the larger thing. If the prefix is larger than the base unit, know how many of the base unit there are in the larger prefix. If the base unit is larger than the prefix, know how many of the smaller prefix is in the larger base unit. (Make a CHART in your exam review.)
6. Distinguish between a quantity, a unit, and a measurement standard. Give two examples.
7. Name SI units for length, mass, time, temperature, energy, volume, and density.
8. Convert Celsius temperatures to Kelvin and Kelvin temperature to Celsius.
9. Perform unit conversions using the factor-label method (the Q formula). (Give four examples.)
10. Explain the difference between mass and weight.
11. Solve volume problems. Calculate volume using a formula and then use the Q formula to change the calculated volume to liters. (Give one example.)
12. Solve density problems (give one example of each – finding density, mass, and volume).
13. Explain the difference between accuracy and precision.
14. Measure mass, length, and volume in significant figures. (Draw one example each of a measurement from a balance, meter stick, and graduated cylinder. Only draw a blow up of the scale on the instrument, do not draw the whole instrument.)

15. Determine the number of significant figures in calculations. (Give four examples.)
16. Use scientific notation to write numbers and make calculations. (Give four examples.)
17. Define, give the equation, and plot a graph of a direct proportionality. (The graph can be a rough draft graph drawn on notebook paper.)
18. Define, give the equation, and plot a graph of an inverse proportionality. (The graph can be a rough draft graph drawn on notebook paper.)
19. Define chemistry and identify some (3) applications of chemistry in everyday life.
20. Define the branches of chemistry and give an application of each.
21. Compare and contrast basic research, applied research, and technological development and give 2 examples of each
22. Distinguish between qualitative and quantitative properties and give 3 examples of each.
23. Distinguish between physical and chemical properties and give 3 examples of each.
24. Describe the three evidences for a chemical change and give an example of each.
25. Classify changes in matter a physical or chemical and give reasons for your choice.
26. Define the law of conservation of mass and give an example.
27. Define the four states of matter. Explain the gaseous, liquid, and solid states of matter in terms of particles using a drawing of each.
28. Define the six changes in state between solids, liquids, and gases, and describe the role of energy in each.
29. Distinguish between exothermic and endothermic reactions.
30. Define the law of conservation of energy and give an example.
31. Define kinetic and potential energy and show how each can change.
32. Define heat and temperature and explain A) how an iceberg could have more heat than a burning match and B) why a cup of boiling water would burn you but sticking your hand in a very hot oven would not burn you
33. Use the difference in heat and temperature to explain why you can boil water in a paper cup.
34. Distinguish between homogeneous and heterogeneous matter, mixtures and pure substances and give example of each.
35. Describe in detail how you could use your knowledge of physical properties to separate a mixture that contained at least three different substances that have three different properties
36. Draw and label a diagram showing the method of purifying water by distillation.
37. Know the names, symbols, and oxidation numbers of the common elements. *(You must know this information for the exam; however, this would be a ton of information to include in your extra credit. Therefore, make sure you know this, but you may leave it out of the extra credit.)*
38. Discuss three differences in properties between metals, nonmetals and metalloids, and give examples of their uses.

39. Memorize the metalloids use the periodic table to determine if other elements are metals, nonmetals, or metalloids. (Give four examples of each.)

40. Use the steps of the scientific method to solve a "problem" and define each step.

41. Determine the formula and name of an ionic compound between any two elements or ions. (4 examples of each)

42. Determine the formula and name of an ionic compound between two given elements or ions when the when the first element can have more than one oxidation number. (3 examples with monatomic ions, 3 examples with polyatomic ions)

43. Using prefixes name a binary molecular compound from its formula and write the formula of a binary molecular compound given its name. (3 examples with nonmetal and nonmetal, and 3 examples with metalloid and nonmetal)

44. Memorize the names and symbols of common polyatomic ions. (List all)

45. Memorize the chemical names and formulas of common substances. (List all)

46. Memorize the names and formulas of the common laboratory acids. (List all)

47. Give the oxidation number for each element in the formula of a chemical compound. (4 examples)

48. Give the oxidation number for each element in the formula of a polyatomic ion. (4 examples)

49. Define mole in terms of Avogadro's number, and define molar mass.

50. Solve problems involving mass in grams from moles, amount of atoms from moles, and amount of atoms from mass. Give one example of each.

51. Calculate the formula mass or molar mass of any given compound and use molar mass to convert from mass in grams of a compound to moles of that compound. (2 examples)

52. Determine the number of molecules in a certain number of moles or given mass of a compound.

53. Calculate the percent composition of a given chemical compound.

54. Find the simplest formula of a compound from either percent or mass composition use it to find the molecular formula.

55. List four natural polymers and four synthetic polymers

56. Describe the differences in the structures of linear, branched, and cross-linked polymers and how these differences contribute to their properties and their uses.

57. Describe five symbols that are used in chemical equations and use them in a balanced equation (they may be in the same or different equations).

58. Define diatomic molecules and list the formulas for the diatomic molecules.

59. Define and give general equations for synthesis, decomposition, single replacement, double replacement, and combustion reactions.

60. Write balanced equations for synthesis, decomposition, single replacement, double replacement, and combustion reactions. (One example of each)