CHEMISTRY
2ND SEMESTER EXAM REVIEW - SENIORS

THE FOLLOWING IS A LIST OF OBJECTIVES THAT YOU SHOULD HAVE ACCOMPLISHED THIS SEMESTER IN CHEMISTRY. YOU SHOULD ANSWER EACH ONE BEFORE YOU TAKE YOUR EXAM.

BONUS: YOU MAY RECEIVE A 0.2 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.

DO NOT COPY ANYONE ELSE'S WORK **(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. 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.)*

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

3. 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. (4 examples of each)

4. 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)

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

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

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

8. 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)

9. Determine the number of molecules in a certain number of moles or given mass of a compound. (one example of each (two problems total)

10. Calculate the percent composition of a given chemical compound. (one example)

11. Find the simplest formula of a compound from either percent or mass composition use it to find the molecular formula. (one example)

12. List four natural polymers and four synthetic polymers

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

14. Describe the differences in thermosetting and thermoplastic polymers and how these differences contribute to their properties and their uses.

15. 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).

16. Define diatomic molecules and list the formulas for the diatomic molecules.
17. Give four examples of evidence of a chemical change.
18. Define and give three examples for synthesis reactions.
19. Define and give three examples for decomposition reactions.
20. Define and give three examples for single replacement reactions.
21. Define and give three examples for double replacement reactions.
22. Define and give three examples for combustion reaction.
23. Use the activity series to predict whether or not single replacement reaction will occur. Write two (2) examples of reactions that will not occur – one with metals and one with nonmetals.
24. Use the activity series to predict whether or not the synthesis of oxides (burning in air) reactions will occur and what the product will be. Write one (1) balanced equation for a reaction that will occur and one (1) example of a reaction that will not occur.
25. Use the activity series to predict whether or not the decomposition of oxides reactions will occur and what the product will be. Write one (1) balanced equation for a reaction that will occur and one (1) example of a reaction that will not occur.
26. Given a chemical reaction, work mole-mole stoichiometry problems *(work two examples – make up your own equation or use one from the book).*
27. Given a chemical reaction, work mole-mass and mass mole stoichiometry problems (one example of each - *make up your own equation or use one from the book*).
28. Given a chemical reaction, work mass-mass stoichiometry problems (two examples - *make up your own equation or use one from the book*).
29. Given the amounts of two reactants in a chemical reaction, determine which of the reactants is the limiting reactant and calculate the mass of a product (one example - *make up your own equation or use one from the book*).
30. Define theoretical yield, actual yield, and percent yield and explain how to calculate percent yield.
31. Given the mass of a reactant in a chemical reaction and the mass of a product produced in the experiment, calculate the percent yield of the reaction (one example - *make up your own equation or use one from the book*).
32. State the laws of conservation of mass, the law of definite composition, the law of multiple proportions and explain their meanings with an example of each law.
33. Summarize the five essential points of the modern atomic theory and be able to describe how it has changed from Dalton's atomic theory.
34. Describe the properties of protons, neutrons, and electrons.
35. Explain the contribution(s) each of the following made to chemistry: Antoine Lavoisier, Joseph Proust, John Dalton, J. J. Thomson, Robert Millikan, Ernest Rutherford, James Chadwick, and Lise Meitner.
36. Define atomic number and mass number, and describe how they apply to isotopes.
37. Describe the three isotopes of hydrogen: name, symbol, atomic number, mass number, number of protons, neutrons, and electrons.
38. Given hyphen notation, find the number of protons, neutrons, and electrons in an isotope (give 3 examples).

39. Given a nuclear symbol, determine the number of protons, neutrons, and electrons in an isotope (give 3 examples).

40. Calculate the average atomic mass of an element given the relative abundances of each isotope of the element. Give one example.

41. Describe the roles of the Becquerel, Curies, the Joliot-Curies, and Enrico Fermi in nuclear chemistry.

42. Define and describe the factors that influence nuclear stability.

43. Describe 5 properties of radioactive nuclides.

44. Identify five types of nuclear decay and give an example of each in a nuclear equation.

45. Define half-life and use it in a problem to find time passed and amount remaining (include 2 separate problems).

46. Describe four uses of radioactive isotopes.

47. Define nuclear fission, chain reaction, and nuclear fusion and distinguish between them.

48. Describe the function of control rods, nuclear fuel, moderators, and coolants in nuclear reactors.