**Oxford High School**

**Chemistry**

**Chapter 1-16 Cumulative Review**

Use the following equation to answer questions 1-3

N2(g) + 3H2(g) ↔ 2NH3(g)

1. In terms of Le Chatelier’s Principle, *why* is the final concentration of NH3 greater than the initial concentration if H2(g) is added to the reaction?
2. In terms of collision theory, *why* does the concentration of NH3 increase immediately after the addition of H2(g)?
3. Write the keq expression for this reaction
4. Given the reaction

N2(g) + O2(g) + 182.6 kJ ↔ 2NO(g)

1. List four ways to shift the equilibrium to the right?
2. Is this reaction endothermic or exothermic?
3. In the equilibrium reaction 2A + B ↔ C + 3D, the molar concentrations are A=1, B=4, C=8, and D=2. What is the value for the equilibrium constant?
4. A gas has a density of 0.7071 g/L at STP. What is the molar mass of the gas?
5. How many moles are in 3.25 x 1021 atoms of Al?
6. How many molecules are in 0.75 mol of water?
7. What is the mass of 5.85 x1022 molecules of CO?
8. How many formula units are in 1.83 g of NaCl?
9. A compound with a mass of 7.36 g decomposes to form 6.93 g of oxygen.
10. If the other element in the compound is hydrogen, how many grams of hydrogen are in the compound?
11. What is the empirical formula for this material?
12. If the molecular mass is 102 g/mol, what is the molecular formula?
13. State the law of definite proportions
14. Use definite proportions to explain why H2O is considered a pure substance.
15. Consider the compound CuS
16. Name this compound
17. What is the percent composition of each element?
18. How much copper would there be in a 150 g sample of this material?
19. Would this material be a good source of copper to mine? Why or why not.
20. Explain how ionic bonds are formed. Be sure to include the terms octet, cation, anion, gain of electrons, loss of electrons, metals, nonmetals, attractive force and position of bonding electron within the compound.
21. Explain how covalent bonds are formed. Be sure to include the terms octet, nonmetals, attractive force, position of the electron within the bond, nonpolar and polar molecules.
22. Using a chart of electronegativity values, predict whether the following bonds will be polar, nonpolar, or ionic. Show all work.
23. C-H
24. H-O
25. F-F
26. K-Cl
27. Water and hydrochloric acid are both polar molecules and carbon tetrachloride is nonpolar.
28. Write the formula for each
29. Draw the Lewis structure for each molecule.
30. Diagram the three dimension shape for each molecule