Chemistry Exam Review

**Chemistry Calculations**

**Exam review**

1. What is the molar mass of sodium sulfate?
2. What is the molar mass of di - hydrogen tetra – oxide?
3. If you wanted to make a 1.5 molar magnesium hydroxide solution, how many grams would you need to dissolve in one liter of water?
4. If you reacted 15 g of sodium with 10.5 L of Hydrogen gas which is the limiting reactant?
5. How many moles are in 15 g of water?
6. How many molecules of carbon dioxide are in 50.6 g?
7. Convert 10 g Calcium to pieces (atoms).
8. How many grams will .05 moles of magnesium occupy?
9. **If you measured the volume of 13.4 ml of a solution, and the actual volume was 14.5 ml, what was your percent error?**
10. **If the doctor measured your weight to be 2189.9 Kg, when it is actually 95 Kg, what was his percent error?**
11. **If you calculated the density of a rock to 1125.6 g/ml, when the actual density was 150.2 g/ml, what was your percent error?**
12. **If an object had a mass of 325 g and a volume of 45.69 ml, what is it’s density?**
13. **If an object had a volume of 130 ml and a mass of 278 g, what would the density be?**

Metric Conversions

1. **10 g = \_\_\_\_ mg .375 Km = \_\_\_ cm**
2. **.01 L = \_\_\_\_ ml 2,500 cm = \_\_m**
3. **55 m = \_\_\_ mm 500 cg = \_\_\_\_\_ mg**
4. **1,000 Kg = \_\_\_\_cg .7 dl = \_\_\_\_\_ ml**
5. **% Comp. Of Sodium in sodium Phophate?**
6. **% comp. Of C in CO5?**

**Limiting Reactant**

1. **If 100.5 L of oxygen gas reacted with 10.6 g of Gallium Carbonate, which would be the limiting reactant?**
2. **If 15.5 g of magnesium sulfide reacted with 15 ml of .9 M Lead (II) Acetate, which would be the limiting reactant?**
3. **How many grams of NaCl would you need to dissolve in one liter of water to make a 1.13 molar solution (Hint: Molar mass x .13)?**
4. **If 20 ml of a 2.5 M KOH solution was used to neutralize 32 ml of HNO3, what is the molarity of the acid (HNO3 )?**
5. **If 45 ml of HCl was used to neutralize 20.1234 ml of a .5 M Ca(OH)2 solution, what is the molarity of the acid?**
6. **If you wanted to make a .1 M solution of cesium fluoride, how many grams would you dissolve in 1 liter of water? (same as #1)?**

Chemistry Lab Review

One of the 4 lab reports will be the one that you write on the exam. Assignment: write a procedure and a conclusion for all 4 of the following:

**Activity Series Lab I**

**Problems:**

1. **How can you determine if a chemical reaction between 3 metals and 6 solutions have occurred or not?**
2. **How can you use your observations to make an activity series of several positive ions?**
3. **Will the reactions that you observe be single replacement, souble replacement, synthesis or decomposition?**

**Material: Mg, Cu, Zn, MgSO4, H2SO4, ZnSO4, CuSO4, Pb(NO3)2, AgNO3 and a chem plate.**

**Data: R = reaction. NR = nor reaction. X = Trial not needed**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **MgSO4** | **H2SO4** | **ZnSO4** | **CuSO4** | **Pb (NO3)2** | **AgNO3** |
| **Mg** | **X** | **R** | **R** | **R** | **R** | **R** |
| **Cu** | **NR** | **R** | **NR** | **X** | **NR** | **R** |
| **Zn** | **NR** | **R** | **X** | **R** | **R** | **R** |

**Activity Series:**

**1.)**

**2.)**

**3.)**

**4.)**

**5.)**

**6.)**

**Conclusion: from notes.**

**Density of water Lab**

**Problem: Which technique will be the most accurate way to calculate density: using two measurements and the equation (M/V) or solving the slope of a mass vs. volume graph?**

**Material: scale, water, graduated cylinder.**

**\*\*Calculations must include:**

1. **One density calculated using the equation.**
2. **The slope of your graph.**
3. **Percent error for both densities.**

**Data , Graph, Calculations:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Mass** | **Volume** | **D (m/v)** | **D (slope)** |
| **4.5g** | **5 ml** |  |  |
| **9.7** | **10** | **X** | **X** |
| **15** | **15** | **X** | **X** |
| **18.7** | **20** | **X** | **X** |
| **24.9** | **25** | **x** | **X** |

**\*\*Actual density of water at room temp: .99987 g/ml**

**Be sure to calculate % error.**

**Conclusion: Questions from the notes.**

**Heating Acid Lab**

**Problems:**

1. **How does the temperature of the reactants effect reaction rate?**
2. **How can you change the concentration of a solution?**
3. **How will changing the Molarity (concentration) effect the reaction rate?**

**Material: water, acid, Mg, Hot plate, stop watch.**

|  |  |
| --- | --- |
|  | **Reaction time (s)** |
| **Acid (10 ml) + Mg** | **45.9** |
| **Acid / water (10ml of each) mixture** | **90** |
| **Acid (10 ml) @ 70 C** | **30.5** |

**Conclusion. Answer the following using complete sentences.**

1. **How did the reaction rate change when you changed the temperature?**
2. **How did the reaction rate change when you changed the concentration?**
3. **What is another name for concentration?**
4. **What do you think happened to the molecules when you heated up the acid? Why do you think this changed the reaction rate?**

**Graphing and Reaction Temperature**

**Lab.**

**Problem: How can you use a graph to compare the change in temperature of three different metals when they react with an acid?**

**Material:**

**3 metals, acid, stop watch, thermometer.**

**Data: take a temperature every 10 seconds for 3 minutes for all three metals.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Mg** | **Time**  **(s)** | **Temp**  **(C)** | **Ca** | **Time**  **(s)** | **Temp**  **(C)** | **Zn** | **Time**  **(s)** | **Temp**  **(C)** |
|  | **0** | **20** |  | **0** | **19** |  | **0** | **19** |
|  | **10** | **20** |  | **10** | **20** |  | **10** | **19** |
|  | **20** | **20** |  | **20** | **24** |  | **20** | **19.5** |
|  | **30** | **20.5** |  | **30** | **30** |  | **30** | **20** |
|  | **40** | **20.9** |  | **40** | **35** |  | **40** | **20** |
|  | **50** | **21** |  | **50** | **36** |  | **50** | **20** |
|  | **60** | **22** |  | **60** | **36** |  | **60** | **20** |

**Make a graph of the Data.**

**Conclusion:**

What data is on your graph? What units were used? What is the relationship between the reaction time of calcium and its change in temperature? What are some reasons for the relationship (between calcium and reaction time) that you just explained? Explain the relationship between the change in temperature and the reaction time of Zinc. By looking at the graph, is there evidence of a chemical reaction between the acid and the Calcium?

Exam study guide.

\*\*Write at least 2 pages (2sides) that covers the information below.

1. Be able to make a graph out of two or more sets of data also, be able to answer questions that are related to the graph.
2. Know what density is, how to graph it, how to solve the slope of the line on a graph to get density and the units that measure it.
3. Know what % error is and how to calculate it.
4. Know the 4 observations that are evidence of a chemical change. Know the difference between a chemical and a physical property and the difference between a chemical and a physical change.
5. Know what atoms, compounds and mixtures are. Be able to give examples of each. Know what atoms are made of and how to use the periodic table to figure out how many protons, neutrons and electrons are in them. Know where the metals, non metals, halogens and noble gases are on the periodic table.
6. Know what scientific notation is for and how to use it. Know what combustion is.
7. Know what quantum numbers are for. Know what the four that were covered in class.

1. Know how to neutralize waste and how to use Universal Indicator.
2. Know how to tell the difference between covalent and ionic compounds. Know how to name both kinds of compounds. Know how to name ionic compounds that involve the transition metals.
3. Know what percent composition is for and how to calculate it.
4. Know what electron electronegativity is and what ionization energy is. Know how to use the periodic table to compare these two properties of different kinds of atoms.
5. Know what happens to water when electricity is ran through it. Know which lead (positive or negative) attracted the hydrogen and which attracted the oxygen and why. Know which one is the most explosive out of the two gases.
6. Know the five covalent prefixes that were covered in class. Know the pattern of oxidation numbers across the periodic table and which kind of compound you need to use for the chemical formulas.
7. Know how to compare the conductivity and solubility of an ionic formula and a covalent compound.
8. Know the main parts of a chemical equation and generally how to balance them.
9. Know what the law of definite proportions and conservation of mass and how they are related to chemical reactions.
10. Know how to separate the water that is physically bonded to a copper sulfate (blue crystal) and how to calculate the percentage of the water that was lost.
11. Know what families and periods are on the periodic table.
12. Know what flame tests are for.
13. Know how to carry out an “ion exchange” in order to write a chemical equation.
14. Be able to identify a precipitate if you are given the data needed to do so (blue and yellow precipitate).
15. Know what pH is for and what it measures.
16. Know what synthesis, decomposition, single replacement and double replacement reactions are.
17. Know what equilibrium is and be able to give examples of it.
18. Know the Conservation of Mass law and the Law of Definite proportions.
19. Know what percent composition is and how to calculate it.
20. Know how internal combustion work in general and that there are several reactions that are involved in this process.
21. Know what the Mass defect theory is and how it is related to fusion.
22. Know what valence electrons are and how to draw Lewis Dot diagrams.
23. Know what the Mole is and why it is considered a “relative mass”.
24. Know how to convert from moles to grams, moles to atoms, molecules or formula units and vise versa.
25. Know what the molar volume is for all gases. Know how to use this to convert from liters to moles.
26. Know what an activity series is and how to make one if you are given the observations that you need.
27. Know what solubility is and how temperature effects it.
28. Know what the abbreviations for the reactants are and what they stand for (Solid, Liquid, Gas and Aqueous Solution).
29. Know how to use the solubility table to determine if an ionic compound is soluble and if a double replacement reaction will occur or not.
30. Know that the atomic masses (atomic mass units) on the periodic table are also the. molar masses (g).

Atomic and Molar mass

1.0079

H

Hydrogen

1

1. Know what a catalyst is and how they work. Know what activation energy is and how it is related to catalysts. Know what inhibitors are.
2. Know what limiting reactants are and how to calculate them. Also, know how they are related to grilled cheese sandwiches.
3. Know what valence electrons are and how to write Lewis dot diagrams.
4. Know what Charles’ Law is and what Boyle’s Law is.
5. Know what solubility is, what happens to it when the temperature of the water goes up, and how to use the solubility chart to determine the formula of a precipitate.
6. Know what enthalpy is and how to calculate it.
7. Know what reaction rate is and how concentration (molarity) effects it.
8. .) Know what pH is, how to use it and what it represents. Know how to use universal indicator and phenolthelien.
9. 2.) Know what ions are in all acids and bases. Know how the strength of acids and bases are determined. Know what “dissociation” means.
10. Know what titration is and how to use it to compare the strength of two differently concentrated vinegars.
11. Know what neutralization is and the products that are produced when an “actual” neutralization takes place.
12. Know how to calculate the amount of grams needed to create a given molarity (molarity x molar mass).
13. Know what salts are, when they can be acidic, basic and when they can be neutral.
14. Know how to determine the pH of 6 different solutions using 3 different kinds of indicators. Know how to use neutralization and the temperature change of two different acids using NaOH, Mg, and a thermometer.
15. Know how reactive dyes work and some advantages of reactive dyes as opposed to traditions dyes.
16. Know what chemical systems are and the things that interact to cause them.
17. Be able to calculate Limiting reactant and % Composition.

**Unit 7 Study Guide**

Write at least 1 page on the information below.

1. Know how to name and give the formulas for binary and ternary acids.
2. Know what polarity is and how to determine the difference between the polarities of different solutions.
3. Know what electrolytes are and how to determine the effectiveness of several different solutions.
4. Know what a buffer is and how to determine if it is acidic resisting or basic resisting.
5. Know what oxidation and reduction is. Know what the oxidizing agent is and the reducing agent is.
6. Know what the freezing point of a substance is and how to determine it. Know what a freezing point depression is.
7. Know what polymers are and how they are classified. Be able to give examples of the different classifications of polymers.
8. Know what reaction rate is and how it is effected by temperature and concentration (Molarity).

Unit 8 Chemistry

Study guide.

\*\*Write at least one page (side) on the subjects below.

1. Know what enthalpy is, how it is calculated and what happens during an endothermic and exothermic reaction.
2. Know what polar molecules are and how they are related to water, ink and other dyes (tie dye).
3. Know how to name acids and give the formulas of them.
4. Know how to name and give draw pictures of straight organic compounds.
5. Know what an isomer is, how to name them and how to draw them if you are given the name.
6. Know what benzene is and how to name and draw isomers of them if you are given the name.
7. Know what hard and soft water are and how to compare the two of them.
8. Be able to calculate the heat given off by a nut.