Chemistry 115 Name

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Exam 1A September 21, 2009

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|  | Points Earned | Points Possible |
| Part 1  multiple choice |  | 30 |
| Part 2  nomenclature |  | 10 |
| Page 3 |  | 12 |
| Page 4 |  | 19 |
| Page 5 |  | 19 |
| Page 6 |  | 10 |
|  |  |  |
| Total |  | 100 |

Note: All work must be shown to receive credit. On calculation problems show answer with the correct number of significant figures using scientific notation if necessary.

Useful data:

Part 1 – Multiple Choice (30 points)

1. Why study chemistry?
   1. To help inform us about our world
   2. To be better able to make informed decisions
   3. To better understand the properties of matter
   4. To help us learn a technique for identifying and solving problems
   5. All the above
2. Which is a substance?
   1. element
   2. compound
   3. mixture
   4. both A and B
   5. none of the above
3. One kilometer is equal to
   1. 0.001m
   2. 0.01m
   3. 100m
   4. 1000m
   5. 1000 cm
4. How many zeroes are significant in the number 0.08040?
   1. 1
   2. 2
   3. 3
   4. 4
   5. Can not be determined
5. Physical properties include all the following except
   1. Boiling point
   2. Reactivity with other substances
   3. Odor
   4. Specific gravity
   5. Color
6. When expressed in proper scientific notation the number 0.00364 is
   1. 3.64 X 103
   2. 3.64 X 102
   3. 3.64 X 10-2
   4. 3.64 X 10-3
   5. 3.64 X 10-5
7. The majority of the elements are
   1. Metals
   2. Gases
   3. Nonmetals
   4. Metalloids
   5. Liquids
8. The elements on the periodic table are placed in order of increasing
   1. Density
   2. Atomic number
   3. Boiling point
   4. Atomic mass
   5. Atomic size
9. How many different elements are present in the compound FeSO4?
   1. 1
   2. 2
   3. 3
   4. 4
   5. 6
10. How many atoms of oxygen are indicated in the formula Fe(NO3)2?
    1. 2
    2. 3
    3. 4
    4. 5
    5. 6
11. Which is an anion?
    1. Cl-1
    2. H2
    3. Fe
    4. Fe+2
    5. Cl2
12. Which cannot be broken down chemically or physically into a simpler substance?
    1. Sugar
    2. Salt
    3. Seawater
    4. Copper
    5. Lasagna
13. Which chemical symbol is properly written?
    1. CA
    2. Cu
    3. CO
    4. CL
    5. ni
14. Carbon, when burned completely, forms carbon dioxide. If 11.7g of carbon combines with 31.3g of oxygen, what mass of carbon dioxide will be produced?
    1. 11.7g
    2. 19.6g
    3. 31.3g
    4. 43.0g
    5. None of the above
15. Which is the correct name for the Mg +2 ion?
    1. Manganese ion
    2. Magnesium ion
    3. Manganide ion
    4. Magneside ion
    5. Magnesium(II) ion

Part 2 – Nomenclature (10 points)

Fill in the following chart with the correct name or formula for the following elements and compounds.

|  |  |
| --- | --- |
| Compound / Element / Ion Name | Formula / Elemental / Ion Symbol |
| sodium |  |
| Chromium(III) ion |  |
|  | Ni |
|  | Al+3 |
| Magnesium chloride |  |
| Ferric iodide |  |
| Silicon dioxide |  |
|  | Zn3N2 |
|  | NiBr3 |
|  | PCl5 |

Part 3 – Problems and Questions (60 points)

1. (6 points) Evaluate each of the following expressions. State the answer to the proper number of significant figures.
   1. 92.041 + 16.3 + 1901.22 =
2. (6 points) Complete the following metric conversions using dimensional analysis. No credit will be given without work complete with units. Give answer to the correct number of significant figures.
   1. 8.23 cm to m
   2. 96.3 mg to kg
3. (8 points) Complete the following American / metric conversions using dimensional analysis. Give answer to the correct number of significant figures (If you have forgotten a conversion factors for g to lb or cm to in, make up a number and show the correct set-up for partial credit.)
   1. 51.7 kg to lb
   2. 4.22 x 10-6 ft to nm (1 m = 109 nm)
4. (6 points) The velocity of light is 1.86 x 108 miles/hour. The distance of Mercury from the sun is approximately 5.78 x 107 km. How many minutes will it take for light from the sun to travel to Mercury? (5280 ft = 1 mile)
5. (5 points) The mass of an empty container is 94.363 g. When the container is filled with 50.00 mL of a liquid, the mass of the container increases to 174.330 g. What is the mass of the liquid in the container?

What is the density of the liquid?

1. (5 points) The density of homogenized milk is 1.03 g/mL. What is the mass of one cup (236 mL) of homogenized milk in grams?
2. (5 points) A solution of 18.27 g sample of sugar syrup is heated until the water has boiled off and 3.44 g of sugar remain. What percent sugar is found in the syrup?
3. (5 points) A sample of bronze is 35.9% copper by mass. Find the mass of bronze that contains 50.0 g of copper.
4. (4 points) In Europe, most recipes specify the mass of flour used to make baked goods. In the United States, flour is usually specified by volume. Comment on whether one method may yield more consistent results than the other.
5. (6 points) Give definitions for the terms pure substance and mixture and give two examples of each type of material.

Pure substance –

1.

2.

Mixture –

.

1.

2.

1. (4 points) Frequently people use the phrase “I have a theory about that” when describing an observation they have made. Comment on the appropriateness of the word “theory” in this context. (Think about how is a theory defined in the context of science?)