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Community College of Rhode Island

Chemistry Department

Basic Skills for Chemistry

CHEM-1020-150

Hour Exam No. 2

Covering KWL Chapters 3 and 4 (partial)
Covering Experiments 3 and 4

Wednesday, April 1, 2009

Twelve Questions, 50 Minutes, 102 Points

Closed book examination, No notes allowed

A periodic table is attached to the back of this exam

Answer the questions in the spaces provided.

To receive full credit for your work:

- a) Show all your mathematical setups clearly.
- b) Express your answers with the proper units and the correct number of significant figures.
- c) When appropriate express numerical values in proper scientific notation.

1. Convert each quantity: (25 points)

a) 0.0090 km to cm

b) 738.5 mL to μL

c) 3190. mg to cg

d) 764 mg to pounds. (1 pound = 454.4 g)

e) 400. mL to gallons. (1 quart = 0.946352946 L: 1 gallon = 4 qt)

2. Write the name of the element corresponding to each atomic number or atomic symbol. Proper spelling counts. (8 points)

27

Sn

48

K

56

Br

5

Na

3. Give an example of potential energy due to composition. (4 points)
4. A cube of lead weighing 176.00 g measures 2.50 cm on a side. Calculate the density of lead. (8 points)
5. Using a 30.000 g sample of iron, a student reports a density of $7.874 \text{ g}\cdot\text{cm}^{-3}$. Another student is issued a 60.000 g piece of iron. Will the density of the second piece be greater or smaller than or the same as the density of the first piece. Explain the reason for your answer. (8 points)
6. Define the terms anion and cation. (4 points)
7. Calculate the percentage of sugar in a solution containing 6.0 g of sugar and 30.0 g of water. (5 points)

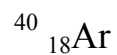
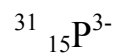
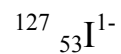
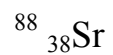
8. The per cent error formula is: $\% \text{ error} = \left| \frac{\text{reference value} - \text{experimental value}}{\text{reference value}} \right| \times 100 \%$

A student obtains a value of 12.5 g/cm^3 for the density of a metal. The accepted density value is 12.346 g/cm^3 . Calculate the percent error for the determination. (8 points)

9. Sketch and describe the makeup of the atom. Name the subatomic particles, give their masses and charges and tell where each is located in the atom. (6 points)

10. State the number of protons, neutrons and electrons in each of the following:

(12 points)



11. The atomic mass of chlorine in the periodic table is given as 35.453 amu. How can chlorine have a decimal fraction atomic mass value given that it is not possible to have a fraction of a proton or neutron? (6 points)

12. What is the specific heat of a metal if the temperature of a 386.78 g piece of the metal increases from 56.7 °C to 88.7 °C by the application of 6280 J of heat? (8 points)