**Exam 1: Chem 1114 Fall 2014**

**Version B 100 points**

**Your name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1.1. How old is Doc Fong’s boy cat ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_­­­­­\_\_\_\_\_\_

1.2 What is Doc Fong’s boy cat named ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1.3. What university did Doc earn his Ph. D. at ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1.4. How many cats does Doc Fong have at home ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1.5. What is the universal obsession of chemists ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.1. What is the magnitude associated with a T ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.2. Convert 0.001 g to its equivalent, prefixed form: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.3. The magnitude 10-9 has what prefix name (not symbol) associated with ? \_\_\_\_\_\_\_\_\_\_\_\_\_

2.4. What is the symbol connected to 10-12?\_\_\_\_\_\_\_\_\_\_\_\_\_

2.5. Convert 3,000,000,000 m to its correct prefixed form:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.6 Write 100 kg in scientific notation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ g

3.1. 0.001 mg = \_\_\_\_\_\_\_\_\_\_\_pg (2 pts each)

3.2. 0.005 cm = \_\_\_\_\_\_\_\_\_ mm

3.3. 8500 cg = \_\_\_\_\_\_\_\_\_\_\_ kg

3.4. 0.031 Ts = \_\_\_\_\_\_ Gs

3.5. 250,000 nm = \_\_\_\_\_\_\_\_ μm

4.1. How many significant figures are in each of the numbers below ?

a) 0.0040\_\_\_\_\_\_\_\_\_\_ b) 60000001\_\_\_\_\_\_\_

c) 0.04560000\_\_\_\_\_\_\_\_\_ d) 4.100\*10-234 \_\_\_\_\_\_\_\_\_\_\_\_

e) 100\_\_\_\_\_\_ f) 2.111\_\_\_\_\_\_

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4.2. Compute to the correct significant figure count: ( 2 pts each)

0.00300 + 0.90 + 2 + 611 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3 -0.0001 +3000000 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5.1 Compute to correct sig fig count: 1.500\*1.0090 = \_\_\_\_\_\_\_\_\_\_\_ 3 pts each

1.0\* 0.5003

5.2. Compute to correct sig fig count: (2+0.00014)= \_\_\_\_\_\_\_\_\_

0.5000\*0.5

5.3. Compute to the correct sig fig count:

2.0-0.102000 + 6.00\*6.0 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4.50\*1.999

6.1. An isotope is an element with with a specific count of\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6.2. Electrons are: ***heavier lighter the same mass*** as protons. (Circle your choice)

6.3. How many neutrons in 64Cu(Cu has 29 protons). \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6.4. Provide names or symbols for the elements below: (spelling counts)

Mg\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mercury \_\_\_\_\_\_ Ge\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Au\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ gold\_\_\_\_\_\_\_ Ag\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Sn\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ beryllium\_\_\_ Cr \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7.1. Fill in the missing information (4 points for each completely correct line)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Atomic # | Mass # | symbol | #p | #n | #e | Atom charge |
|  |  | Au |  | 116 |  | 0 |
|  | 80 |  | 35 |  | 35 |  |

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7.2. Compute the average atomic mass of the hypothetic element Bo given the information

below:

Bu mass # % abundance=Pk

198.0 40

199.0 45 average mass of Bo= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ( to nearest 0.1 )

203.0 15

8.1. Provide the name or formula for the compounds below. (You may use your Periodic Table as an aid.)

Note: CO32- = carbonate C2O42- = oxalate spelling counts ! (2 pts each)

P2O4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ chromium(III) carbonate= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

CaC2O4\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ copper(I) nitride= \_\_\_\_\_\_\_\_\_\_\_\_\_

MnCl6 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ lithium oxide = \_\_\_\_\_\_\_\_\_\_\_\_\_\_

9.1. Compute the molecular weight (MW) for: NaHCO3. (Use your Periodic Tables and round to nearest 1 g/mol)

(2 pts)

\_\_\_\_\_\_\_\_g NaHCO3 /mol

9.2. The MW of acetic acid is 60 g/mol How many moles of are in 1200 grams of it?

(4 pts)

\_\_\_\_\_\_\_\_\_\_\_mol acetic acid

9.3. How many grams are in 5.037\*1023 molecules of phosphoric acid? Assume 1 mole count=6.02\*1023

The molecular weight of phosphoric acid is 98 g/mol. (round answer to nearest gram) ( 4 pts)

\_\_\_\_\_\_\_\_ g acetic acid

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Show work for all problems or no credit

10.1 Given that propane (C3H8) has a molecular mass of 44 g/mol and 1 mole count=6\*1023:

How many molecules of propane are in 88 grams of propane ? (5 pts)

\_\_\_\_\_\_\_\_\_\_\_molecules propane

2. The molecular mass of NO2 is 46 g/mol. Given that 1 mole count =6\*1023, how many grams of NO2 are in 7.82 \*1022 molecules of NO2 ? (5 pts)

\_\_\_\_\_\_\_\_ g NO2

11.1 TNT has the formula C9H12O3N3. A sample of this explosive material is found to contain 252 grams of

N (atomic weight 14 g/mol). How many moles of TNT are present ? (5 pts)

\_\_\_\_\_\_\_\_moles TNT

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