**Exam 1: Chem 1114 Spring 2018**

**Version B 100 points**

**Your name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 1 pt**

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

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

3. The magnitude 10+6 has what prefix name (not symbol) associated with ? \_\_\_\_\_\_\_\_\_\_\_\_\_

4. What is the symbol connected to 10-3 ?\_\_\_\_\_\_\_\_\_\_\_\_\_

5. Convert 10,000,000 m to its correct prefixed form:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. Write 0.000000004 g in its best prefixed form\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. 0.1 ms = \_\_\_\_\_\_\_\_\_\_\_μs (2 pts each)

8. 3 nm = \_\_\_\_\_\_\_\_\_ pm

9. 2 cg = \_\_\_\_\_\_\_\_\_\_\_ mg

10. 0.008 Ts = \_\_\_\_\_\_ Gs

11. 5,000,000 mg = \_\_\_\_\_\_\_\_ kg

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

a) 0.01\_\_\_\_\_\_\_\_\_\_ b) 10010000\_\_\_\_\_\_\_

c) 0.301\_\_\_\_\_\_\_\_\_ d) 3.0\*10600 \_\_\_\_\_\_\_\_\_\_\_\_

e) 1.0600000\_\_\_\_\_\_ f) 1000\_\_\_\_\_\_

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

0.000001 - 0.10 + 6.1 + 0.0015 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1.0001 -0.01 +23999.0 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

14. Compute to correct sig fig count: 2.00\*10.0000 = \_\_\_\_\_\_\_\_ 3 pts each

15. Compute to correct sig fig count: 100.000= \_\_\_\_\_\_\_\_\_

2.00\*25.00

16. Compute to the correct sig fig count:

2 + 20.00\*6.00 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1.999

\_\_\_/31 (includes name pt)

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

Fe\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sodium \_\_\_\_\_\_ K\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

He\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ nitrogen\_\_\_\_\_\_\_ Cu\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Mn\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ iron\_\_\_ Zinc\_\_\_\_\_\_\_\_

18. The ratio of the electron orbit’s radius to the nuclear radius is ~ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ( a number)

19.The ratio of the proton mass to the electron mass is about \_\_\_\_\_\_\_\_\_\_\_\_( another number)

20. An element with a specific count of neutrons is a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the element.

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

22. How many neutrons in 19O. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8

23. Fill in the missing information (4 points per line)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Atomic # | Mass # | symbol | #p | #n | #e | Atom charge |
|  |  |  | 10 | 11 |  | 0 |
|  | 81 | Br |  |  | 36 |  |

24. Compute the average atomic mass of the hypothetic element Fu given the data below:

Fu mass # fractional abundance=fk

210.0 0.10

220.0 0.40 average mass of Fu= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ( to nearest 0.1 )

230.0 0.50 (4 pts)

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

Note: ClO4-2 = perchlorate CO3-2 = carbonate spelling counts ! (2 pts each)

SO2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ iron(II) oxide = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

MgClO4= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ copper(II) carbonate= \_\_\_\_\_\_\_\_\_\_\_\_\_

Ca(CO3) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sodium nitride = \_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_/38

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SHOW WORK FOR PROBLEMS BELOW OR NO CREDIT

26. Compute the molecular weight (MW) for: CaCO3 . (Ca=40 g/mol C=12 g/mol O=16 g/mol)

(3 pts)

\_\_\_\_\_\_\_\_g CaCO3 /mol

27. The MW of sulfuric acid is 98 g/mol How many moles of are in 686 grams of it? (5 pts)

\_\_\_\_\_\_\_\_\_\_\_mol sulfuric acid

28. What does 0.2449 moles of sulfuric acid weigh in grams ? ( 5 pts)

\_\_\_\_\_\_\_\_\_\_ g sulfuric acid

29. How many grams are in 2.449\*1022 molecules of sulfuric acid? Assume 1 mole count=6.0\*1023

(round answer to nearest gram) ( 5 pts)

\_\_\_\_\_\_\_\_ g H2SO4

30 Given that octane (C8H18) has a molecular mass of 114 g/mol and 1 mole count=6\*1023:

How many molecules of octane are in 380 g of octane ? (5 pts)

\_\_\_\_\_\_\_\_\_\_\_\_\_ molecules octane

31. The formula for calcium oxalate is CaC2O4. (Molecular wt=128 g/mol)

1. How many moles of CaC2O4 are formed from 128 g of O ? (2 pts)

\_\_\_\_\_\_\_ mol CaC2O4

1. If 3.2 g of O (at. wt.=16 g/mol) are present in CaC2O4, how many g of Ca (at mass=40) are present?

(4 pts)

\_\_\_\_\_\_\_\_ g Ca

32. Glucose has the formula C6H12O6 and a molecular weight of 180. How many atoms of C are in 1.0 g of

glucose ? (5 pts)

\_\_\_\_\_\_\_\_atoms of C

\_\_\_/31