

Chemistry 121
Spring 2005
Test 1, FORM A

Name: _____

Instructions: You have 75 minutes to complete this 100-point exam. You may use a simple scientific calculator. No programmable calculators allowed.

I. Multiple Choice (15 pts, 3 points each) Carefully and clearly circle the best answer. If you circle two answers, *one of which is correct*, you will receive 1 point.

1. Which of the following is the correct molar mass for $\text{Cd}(\text{NO}_3)_2$?
 - a. 142.41 g/mol
 - b. 174.71 g/mol
 - c. 236.42 g/mol
 - d. 349.42 g/mol
 - e. None of the above.

2. A temperature of 579 K is _____ °C.
 - a. 2.1
 - b. 273
 - c. 306
 - d. 852
 - e. None of the above.

3. Elements in Group 7A of the periodic table are called:
 - a. Nonmetals
 - b. Halogens
 - c. Alkaloids
 - d. Alkaline Earth Metals
 - e. Noble Gases

4. The number of significant figures in 0.01020 is:
 - a. 2
 - b. 3
 - c. 4
 - d. 6
 - e. None of the above

5. What is the chemical formula of a molecule with 2 nitrogen atoms, 6 hydrogen atoms, 6 carbon atoms and 1 sulfur atom?
 - a. $\text{N}_2\text{H}_6\text{C}_6\text{S}$
 - b. $\text{C}_6\text{SH}_6\text{N}_2$
 - c. $\text{C}_6\text{H}_6\text{SN}_2$
 - d. $\text{C}_6\text{H}_6\text{N}_2\text{S}$
 - e. None of the above

II. Chemical Formulas, Naming and Atomic Notation

1. (15 pts) Give the chemical formulas for the following:

a. Lead (IV) oxide _____

b. Dinitrogen pentoxide _____

c. Copper (I) phosphate _____

d. Sulfur trioxide _____

e. Ammonia _____

2. (15 pts) Name the following:

a. LiF _____

b. MgSO_4 _____

c. $\text{Na}_2\text{Cr}_2\text{O}_7$ _____

d. $\text{Ca}(\text{OH})_2$ _____

e. TiCl_4 _____

3. (16 pts) Fill in the blanks:

Symbol	Name	# of protons	# of neutrons	# of electrons	Mass number
P					41
Ca			22		
		16	17		
			42		75

III. Calculations: Show all work in the space provided. Partial credit will be given for correct work. If I cannot read the work, it will not be graded.

1. (10 pts) Silver has 2 isotopes: ^{107}Ag with a mass of 106.905092 g/mol and ^{109}Ag with a mass of 108.904756 g/mol. The molar mass of silver is 107.87 g/mol. What are the percent abundances of both of the isotopes?

2. (15 pts) Cumene is a hydrocarbon that is 89.94% carbon and 10.06% hydrogen. Its molar mass is 120.2 g/mol. What are the empirical and molecular formulas of cumene?
3. (10 pts) Saccharin is a common sweetener in low calorie soft drinks. It has a formula of $C_7H_5NSO_3$. (MM = 183.18 g/mol) How many molecules of saccharin are in 27 mg of saccharin? (don't forget to convert mg to g)
4. (10 pts) How many moles of nitrate ions are in 1.56 g of $Ca(NO_3)_2$? (MM of $Ca(NO_3)_2$ = 128.10 g/mol)
5. (4 pts) What is the volume in milliliters of 15 g of Si? (density of Si = 2.33 g/mL)