

Chemistry 121
Fall 2004
Test 1, FORM A

Name: KEY

Instructions: You have 50 minutes to complete this 100-point exam. You may use a simple scientific calculator. No programmable calculators allowed.

$$1 \text{ in} = 2.54 \text{ cm}$$

$$1000\text{g} = 1\text{kg}$$

$$1000 \text{ mg} = 1 \text{ g}$$

I. MULTIPLE CHOICE: (25 pts, 5 points each) Carefully and clearly circle the best answer. If you circle two answers, *one of which is correct*, you will receive 3 points.

1. The mass number of an atom is indicated by:

- a. The number of protons
- b. The number of electrons
- E** c. The number of neutrons
- d. The number of protons + electrons
- e. The number of protons + neutrons

2. The chemical formula for a compound containing 3 oxygen atoms, 5 hydrogen atoms, 4 carbon atoms and 1 fluorine atom is:

- a. $\text{O}_3\text{H}_5\text{C}_4\text{F}$
- b. $\text{C}_4\text{FH}_5\text{O}_3$
- C** c. $\text{C}_4\text{H}_5\text{FO}_3$
- d. $\text{C}_4\text{H}_5\text{O}_3\text{F}$
- e. None of the above

3. The number of significant figures in 0.0059420 is:

- a. 4
- B** b. 5
- c. 6
- d. 7
- e. None of the above

4. Elements in Group 1A of the periodic table are called:

- a. Nonmetals
- b. Halogens
- E** c. Alkaloids
- d. Alkaline Earth Metals
- e. Alkali Metals

5. A temperature of 303 K is _____ °C.

- A** a. 30
- b. 273
- c. 576
- d. 303
- e. None of the above.

II. Short Answer and Calculations (85 pts): Clearly indicate your answer 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) Write the chemical formulas for the following compounds:

- a. Barium sulfate BaSO₄
b. Sulfur tetrafluoride SF₄
c. Iron (II) oxide FeO
d. Potassium nitrate KNO₃
e. Lithium hydroxide LiOH

2. (10 pts) Write the chemical name for the following compounds:

- a. CS₂ carbon disulfide
b. Na₃PO₄ sodium phosphate
c. Al₂O₃ aluminum oxide
d. (NH₄)₂CO₃ ammonium carbonate
e. NCl₃ nitrogen trichloride

3. (5 pts) An element on the periodic table has 26 protons and a mass number of 56.

a. What is the name of this element?

 Iron

b. Write the correct atomic notation.

 ⁵⁶Fe
 26

4. (20 pts) Vitamin E is an acid whose chemical formula is: C₂₉H₅₀O₂.

a. What is the molar mass of Vitamin E? (show all work!)

$$\begin{array}{r} 29 \text{ C} = 29(12.01) = 348.29 \\ 50 \text{ H} = 50(1.008) = 50.40 \\ 2 \text{ O} = 2(16.00) = 32.00 \\ \hline 430.69 \text{ g/mol} \end{array}$$

b. What is the percent composition of hydrogen in Vitamin E? (show all work!)

$$\frac{50.40}{430.69} \times 100 = 11.70\%$$

