

Name: \_\_\_\_\_

**Chemistry 121**  
**Spring2003**  
**Exam I**  
**50 minutes/100 pts**

**I. MULTIPLE CHOICE:** (30 pts, 3 points each) Carefully and clearly circle the best answer.

- In order for Eric Cartman to pass 4<sup>th</sup> grade, he must correctly write 0.005706 in scientific notation with 3 significant figures. Please help Eric out by correctly writing this number.
  - 0.005706
  - $571 \times 10^{-5}$
  - $57.1 \times 10^{-4}$
  - $5.71 \times 10^{-3}$
  - $0.571 \times 10^{-2}$
- What is the correct elemental symbol for manganese? (Not magnesium!)
  - Mg
  - Mn
  - Mo
  - Zn
  - Zn
- What element below has chemical properties similar to those of phosphorous?
  - Si
  - Ar
  - Se
  - N
  - K
- A mixture that is similar throughout is termed:
  - isotonic
  - an isotope
  - homogeneous
  - heterogeneous
  - hydroscopic
- How many protons does Chlorine have?
  - 7
  - 17
  - 35
  - 70
  - 52
- The correct formula for barium sulfate is:
  - BaSO<sub>3</sub>
  - Ba(SO<sub>3</sub>)<sub>2</sub>
  - Ba<sub>2</sub>SO<sub>3</sub>
  - BaSO<sub>4</sub>
  - Ba<sub>2</sub>SO<sub>4</sub>

7. Which of the following is NOT a form of kinetic energy?
  - a. Mechanical Energy
  - b. Electrical Energy
  - c. Thermal Energy
  - d. Sound Energy
  - e. Gravitational Energy
  
8. Name the following compound:  $N_2F_4$ 
  - a. Nitrogen Fluorine
  - b. Dinitrogen Tetrafluorine
  - c. Nitrogen Fluoride
  - d. Dinitrogen Tetrafluoride
  - e. Dinitrogen fluoride
  
9. Convert  $23^\circ C$  to Kelvin
  - a. 23K
  - b.  $-250.K$
  - c. 296K
  - d. 6280K
  - e. None of these
  
10. What is the most massive part of an atom?
  - a. The nucleus
  - b. The electrons
  - c. Only the protons
  - d. Only the neutrons
  - e. Anything not in the nucleus

**II. Short Answers and Calculations** (80 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) Give an example of the following:
  - a. A halogen \_\_\_\_\_
  - b. An alkali metal \_\_\_\_\_
  - c. An alkali earth metal \_\_\_\_\_
  - d. A nonmetal \_\_\_\_\_
  - e. A noble gas \_\_\_\_\_
  
2. (10 pts) An isotope of Aluminum has a mass number of 29. Express this element in atomic notation:
 
$${}^Z_A X$$
  
3. (10 pts) What is the volume (in mL) of a piece of solid bromine that weighs 2.05g and has a density of 3.12 g/mL?

4. (10 pts) What is the molar mass of potassium nitrate,  $\text{KNO}_3$ ?
  
  
  
  
  
  
  
  
  
  
5. (10 pts) What is the weight percent of oxygen in potassium nitrate,  $\text{KNO}_3$ ? (HINT: use answer from #4)
  
  
  
  
  
  
  
  
  
  
6. (10 pts) How many atoms of potassium are in 2.56g of  $\text{KNO}_3$ ? (HINTS: use the molar mass you calculated in #4 and you will need Avogadro's Number for this one)
  
  
  
  
  
  
  
  
  
  
7. (10 pts) What volume of 2.0M NaCl should be used to make 2.00L of 0.050 M NaCl?
  
  
  
  
  
  
  
  
  
  
8. (10 pts) What is the empirical formula of a compound containing 75.7% carbon, 8.8% hydrogen and 15.5% oxygen? (HINT: Assume 100.g and only find the empirical formula, not the molecular formula)