

Name: _____
100 points
Dr. Jay H. Baltsberger

Test 1
Chemistry 121A
September 27, 1993

**SHOW ALL CALCULATIONS
USE PROPER SIGNIFICANT FIGURES AND UNITS**

1. Calculate P from the equation below to the correct number of significant figures. (5 points)

$$\frac{P}{532.1} \times 3.236 = 0.082057 \times 3.201 \times (133.2 + 273.15)$$

2. Two students measure a cube which is known to be exactly 4.321 cm per side. Student A made four measurements of 4.325, 4.221, 4.545 and 4.196 cm. Student B made four measurements of 5.320, 5.322, 5.330 and 5.310 cm. Calculate the average value measured by each student and state which was more accurate and which was more precise (may be the same student). (10 points)

3. Two mole of molecues called rings of sulfur, which is made up entirely of sulfur, has a mass of 513.0 g. Calculate the molecular formula for this compound. (6 points)

sulfur molecular formula = _____

4. A package of aluminum foil contains 75 square feet of kitchen foil and weighs 12 ounces. Aluminum has a density of 2.70 g/cm³. Determine the average thickness of the aluminum foil in millimeters. (1 ounce = 28.4 g and 1 foot = 30.48 cm) This is problem 81 from the chapter 1 of your textbook. (10 points)

aluminum thickness (mm) = _____

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5. Name the following ionic compounds (4 points each):

NaHCO_3 _____

$\text{Ca}_3(\text{PO}_4)_2$ _____

PtCl_2 _____

UF_6 _____

6. Write the empirical formula for the following compounds (4 points each):

dichlorine oxide _____

xenon tetrafluoride _____

vanadium (III) sulfate _____

calcium nitrite _____

7. Calculate the molecular weight of the following compounds (5 points each):

$\text{Co}_2(\text{CO})_8$ _____

Ascorbic Acid, $\text{C}_6\text{H}_8\text{O}_6$ _____

8. Calculate the number of moles in 532.3 grams of vinyl chloride, $\text{C}_2\text{H}_3\text{Cl}$. (6 points)

moles $\text{C}_2\text{H}_3\text{Cl}$ = _____

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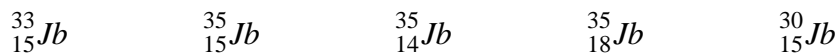
9. A new compound containing xenon and fluorine was created by shining sunlight on a mixture of 0.526 g of Xe and an excess of F₂ gas. If you isolate 0.678 g of the new compound, calculate its empirical formula. (10 points) This is problem 66 from chapter 3 of your textbook.

Xenon Fluoride empirical formula = _____

10. Determine the number of neutrons and protons in a given atom for each of the following elements. (8 points)

Element	Protons	Neutrons
²⁰⁵ Pb	_____	_____
⁸¹ Se	_____	_____

11. Circle the atomic symbols (note that the symbol *Jb* has no real significance and indicates an unknown element) below which are isotopes of the same atom. (3 points)



12. BONUS QUESTION: A compound containing only boron and bromine is 95.685% bromine. Calculate the empirical formula for this compound. (5 bonus points)

Boron Bromide empirical formula = _____