

Name: _____
110 points
Dr. Jay H. Baltsberger

Test 1
Chemistry 121A
September 26, 1994

SHOW ALL CALCULATIONS & USE PROPER SIGNIFICANT FIGURES AND UNITS

Multiple Choice Questions: Circle the single best answer. No penalty for guessing.

1. What is the length of a 1300 cm long block of wood in km? (2 points)
A) 1.3×10^{-6} km B) 1.3×10^0 km C) 1.3×10^{-2} km D) 1.3×10^1 km E) 1.3×10^{-1} km
2. What is the SI unit of length? (2 points)
A) kilogram B) meter C) second D) coulomb E) mole
3. Which of the following is not an element? (2 points)
A) oxygen B) krypton C) natural gas D) carbon E) neon
4. What is the density of a coin which weighs 9.1 g and has a volume of 1.6 cm^3 ? (2 points)
A) 5.7 g/cm^3 B) 0.18 g/cm^3 C) 10.7 g cm^3 D) 14.6 g cm^3 E) $0.18 \text{ cm}^3/\text{g}$
5. Which of the following numbers has the most number of significant digits? (2 points)
A) 0.0005102 B) 1,030,000 C) 10.8 D) 0.0410 E) 9.2100
6. The mass of 3.0 mole of chloroform is 358.13 g. Chloroform is made up of 10.06 % (by mass) carbon, 89.09% chlorine and the remainder hydrogen . Calculate the molecular formula of this compound. (10 points)

chloroform molecular formula = _____

7. Write down three different isotopes of carbon with the correct atomic symbols, indicating both mass and atomic number. (6 points)

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8. Name the following ionic compounds. (4 points each)

K_2CO_3 _____

Cu_2SO_4 _____

$Ca(OH)_2$ _____

PCl_5 _____

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

hydrochloric acid _____

sulfur dioxide _____

iron (III) sulfite _____

calcium hypochlorite _____

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

Li_2HPO_4 _____

Testosterone, $C_{19}H_{28}O_2$ _____

11. Calculate the number of moles in a tablespoon of sugar, $C_{12}H_{22}O_{11}$, weighing 12.6 g.
(6 points)

moles $C_{12}H_{22}O_{11}$ = _____

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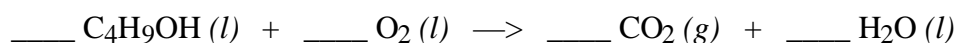
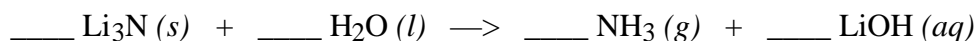
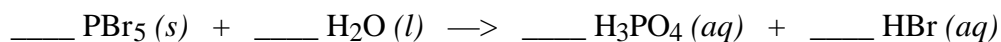
12. Ethylene, C_2H_4 (g), burns in oxygen gas to produce only CO_2 (g) and H_2O (l). Write the balanced equation below. Using this equation, calculate the maximum amount of CO_2 which could be formed when 2.93 g of C_2H_4 reacts with 5.29 g of O_2 . (12 points)

CO_2 produced = _____

13. Determine the number of neutrons and protons in a given atom for each of the following elements. (9 points)

Element	Protons	Neutrons
^{190}Os	_____	_____
^{25}Mg	_____	_____
^{35}Cl	_____	_____

14. Balance the following three equations. (15 points)



15. BONUS QUESTION: Describe in no more than 6 sentences the differences between the Dalton model and the Rutherford model of the atom. (5 bonus points)