

Name: _____

130 points

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Test 1

Chemistry 121AD

September 28, 1998

SHOW ALL CALCULATIONS & USE PROPER SIGNIFICANT FIGURES AND UNITS

$$N_A = 1 \text{ mole} = 6.02 \times 10^{23}$$

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

1. Name the SI prefix used to indicate 10^{-2} . (5 points)

- A) Centi (c) B) Kilo (k) C) Milli (m) D) Nano (n) E) Pico (p)

2. Which number is written with 4 significant figures? (5 points)

- A) 1.2310 B) 0.0123 C) 50.021 D) 0.002311 E) 4100

3. Which of the following is neutral? (5 points)

- A) Sodium ion B) Neutron C) beta particle D) Proton E) Alpha Particle

4. What is the charge on a hypochlorite anion? (5 points)

- A) +2 B) +1 C) -1 D) -2 E) -3

5. Calculate the mass of 3.00 mole of 2-propanol, C_3H_7OH ? (5 points)

- A) 180.284 B) 60.095 C) 59.082 D) 29.013 E) 20.032

6. Calculate the mass percent iron in Fe_3O_4 . (5 points)

- A) 42.9 % B) 24.1 % C) 72.2 % D) 75.0 % E) 96.3 %

7. How many grams of CO_2 are produced when you completely burn 30.2 g of methanol (CH_3OH). (15 points)

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8. Write complete atomic symbols for two isotopes of the element hydrogen. (5 points)

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

$\text{Mg}(\text{NO}_3)_2$ _____

CaSO_4 _____

HIO_4 _____

NaF _____

10. Write the empirical formula for the following compounds (Ba = barium, Xe = xenon). (4 points each)

lithium carbonate _____

xenon tetrafluoride _____

beryllium nitride _____

barium hydroxide _____

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

$\text{MgSO}_3 \cdot 2\text{H}_2\text{O}$ _____

$\text{C}_6\text{H}_5\text{COOCH}_2\text{NH}_2$ _____

12. How many moles of each atom type (Na, C, H and O) are found in 2.00 moles of $\text{NaC}_2\text{H}_3\text{O}_2$? (5 points)

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13. Acetone, the major ingredient in nail-polish remover, contains two elements: O, C and H. When 3.354 g of this substance is completely combusted, 7.625 g of CO₂ and 3.121 g of H₂O are produced. What is the empirical formula of this compound? (12 points)

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

Element	Protons	Neutrons	Electrons
³³ S	_____	_____	_____
¹¹ B ³⁺	_____	_____	_____
²⁰⁷ Pb ²⁺	_____	_____	_____

15. Balance the following equations. (12 points)

