

**CHEM-1094****TEST # 1****NAME:** \_\_\_\_\_

1. In each case, decide if the change is chemical (write C) or physical change (write P)[2]
  - a) A cup of bleach changes the color of your favorite T-shirt. \_\_\_\_\_
  - b) Water vapor condenses on your windshield. \_\_\_\_\_
  - c) Plants use CO<sub>2</sub> from the air to make sugar. \_\_\_\_\_
  - d) When making egg salad the silver spoon is tarnished. \_\_\_\_\_
  
2. Classify each of the following as physical (write P) or chemical (write C) property.[2]
  - a) The density of titanium metal is 4.5 g/cm<sup>3</sup>. \_\_\_\_\_
  - b) Iron turns to rust in the presence of air and water. \_\_\_\_\_
  - c) The normal color of elemental bromine is orange. \_\_\_\_\_
  - d) Tin metal melts at 505 K. \_\_\_\_\_
  
3. Use the word definite or indefinite to describe the shape of: [1.5]
  - a) Solids \_\_\_\_\_
  - b) Gases \_\_\_\_\_
  - c) Liquids \_\_\_\_\_
  
4. Gold has a melting point of 1063°C and a boiling point of 2966°C. Specify the Physical state of gold at: [1.5]
  - a) -200°C \_\_\_\_\_
  - b) 1000°C \_\_\_\_\_
  - c) 2000°C \_\_\_\_\_
  
5. Classify each of the following as a hetero or homogeneous mixture. [1]
  - a) Small chips of iron are mixed with sand. \_\_\_\_\_
  - b) Rum and coke. \_\_\_\_\_

6. Give the number of significant figures in each of the following numbers. **[3]**
- a) 0.0123 \_\_\_\_\_      b) 1.020 \_\_\_\_\_      c) 1.6402 \_\_\_\_\_
- d) 2.300 \_\_\_\_\_      e)  $2.34 \times 10^9$  \_\_\_\_\_      f) 1.1600 \_\_\_\_\_
7. Round off each of the following to three significant figures and express your answer in scientific notation. **[2]**
- a) 3883 \_\_\_\_\_      b) 1000 \_\_\_\_\_
- c) 0.00347 \_\_\_\_\_      d) 27 \_\_\_\_\_
8. Carry out the following calculation, and report your answer in the correct number of significant figures. **[2]**
- a)  $\frac{(0.0546 \times 16.0000 \times 7.779)}{55.85}$  \_\_\_\_\_
- b)  $\frac{1.68(23.56 - 2.3)}{1.248 \times 10^3}$  \_\_\_\_\_
9. Carry out the following conversions.
- a) 25 mg to ng (1 ng =  $10^{-9}$  g) **[1]** \_\_\_\_\_
- b) 15 m<sup>3</sup> to yd<sup>3</sup> (1 yd = 36 in, 1 in = 2.54 cm) **[3]** \_\_\_\_\_
- c) 1.5 L to cm<sup>3</sup> **[1]** \_\_\_\_\_
10. An ancient gold coin is 2.2 cm in diameter and 3.0 mm thick. It is a cylinder for which volume =  $\Pi$  (radius<sup>2</sup>) (thickness). If the density of gold coin is 19.3 g/cm<sup>3</sup>, what is the mass of the coin? **[3]**

11. When you heat popcorn, it pops because it loses water explosively. Assume a kernel of corn, with a mass of 0.125 g, has a mass of only 0.106 g after popping.
- a) What percent of its mass did the kernel lose on popping? **[1]** \_\_\_\_\_
- b) Popcorn is sold by the pound. Using 0.125 g as the average mass of a popcorn kernel, how many kernels are in a pound of popcorn? (1lb = 453.6 g) **[1]** \_\_\_\_\_
- 12.** Automobile batteries are filled with sulfuric acid. What is the mass of the acid (in grams) in 500.0 mL of the battery acid solution if the density of the solution is 1.285 g/cm<sup>3</sup> and if the solution is 38.08% sulfuric acid by mass? **[3]**
13. Determine the quantity of heat that must be added to raise the temperature of a cup of coffee (250 mL) from 20.5°C to 95.6°C. Assume that water and coffee have the same density (1.00 g/mL) and same specific heat (4.184 J/g °C). **[3]**
14. A 88.5 g piece of iron at 78.8°C is placed in a beaker containing 244 g of water at 18.8°C. What is the final temperature when the thermal equilibrium is reached. Specific heat of iron is 0.449 J/g °C). **[4]**

15. Give the name of each of the following elements. **[2]**

a) Mg \_\_\_\_\_

b) P \_\_\_\_\_

c) K \_\_\_\_\_

d) Hg \_\_\_\_\_

16. Give the symbol for each of the elements. **[2]**

a) Zinc \_\_\_\_\_

b) Krypton \_\_\_\_\_

c) Sodium \_\_\_\_\_

d) Lead \_\_\_\_\_

17. Complete the following table: **[4.5]**

Isotope Notation	Z	A	p <sup>+</sup>	n <sup>o</sup>	e <sup>-</sup>
${}_{35}^{80}\text{Br}$					
	92	238			
			29	34	28
	9			10	10

18. a) Name an element in group 2A. **[1]** \_\_\_\_\_

b) Name a halogen that is solid at room temperature. **[1]** \_\_\_\_\_

c) What noble gas element is in the 4<sup>th</sup> period? **[1]** \_\_\_\_\_

d) What alkali metal is in the 3<sup>rd</sup> period? **[1]** \_\_\_\_\_

19. Metals can be drawn into thin wires. What is the name of this property? **[1]**

\_\_\_\_\_

20. A solid can go directly into the gaseous state without going into the liquid state. What is the name of this property? **[1]**

\_\_\_\_\_