Name _____ Class _____ Date _____

Chapter 2/3 Properties of Matter **Study Guide**

Multiple Choice

Write the letter that best answers the question or completes the statement on the line provided.

_____ **1.** Which of the following is a physical change?
- **a.** sawing a piece of wood in half
- **b.** burning a piece of wood
- **c.** rust forming on an iron fence
- **d.** a copper roof changing color from red to green

_____ **2.** Which of the following does NOT show the law of conservation of mass?
- **a.** 24 g of Mg burn in 32 g O_2 to produce 56 g of MgO.
- **b.** 24 mL of Mg burn in 32 mL O_2 to produce 56 mL of MgO.
- **c.** 2 atoms of Mg react with 1 molecule of O_2 to produce 2 units of MgO.
- **d.** 1 atom of Mg reacts with 1 atom of O to produce a unit of MgO that contains 2 atoms.

_____ **3.** Which of the following is evidence of a chemical change?
- **a.** Iron changes color when heated.
- **b.** Gas bubbles form in boiling water.
- **c.** Balls of wax form when melted wax is poured into ice water.
- **d.** A gas forms when vinegar and baking soda are mixed.

_____ **4.** Ninety-nine percent of all the matter that can be observed in the universe exists as
- **a.** gases.
- **b.** plasmas.
- **c.** liquids.
- **d.** solids.

_____ **5.** If you move a substance from one container to another and its volume changes, the substance is a
- **a.** solid.
- **b.** liquid.
- **c.** gas.
- **d.** solution.

_____ **6.** Forces of attraction limit the motion of particles most in
- **a.** a solid.
- **b.** a liquid.
- **c.** a gas.
- **d.** both b and c

_____ **7.** The phase change that is the reverse of condensation is
- **a.** freezing.
- **b.** sublimation.
- **c.** vaporization.
- **d.** melting.

_____ **8.** During a phase change, the temperature of a substance
- **a.** increases.
- **b.** decreases.
- **c.** does not change.
- **d.** increases or decreases.

_____ **9.** If a solid piece of naphthalene is heated and remains at 80°C until it is completely melted, you know that 80°C is the
a. freezing point of naphthalene.
b. melting point of naphthalene.
c. boiling point of naphthalene.
d. both a and b

_____ **10.** Which of the following statements about ice melting is true?
a. Energy flows from the ice to its surroundings.
b. Water molecules move from their fixed position.
c. Water molecules lose energy.
d. The temperature of the ice increases as it melts.

_____ **11.** The phase change in which a substance changes from a solid to a gas or vapor without changing to a liquid first is
a. sublimation. **b.** deposition.
c. vaporization. **d.** melting.

_____ **12.** The phase change in which a substance changes from a gas directly to a solid is
a. condensation. **b.** vaporization.
c. deposition. **d.** sublimation.

_____13. During a chemical or physical change, energy may be
a. created. c. greatly increased in strength.
b. destroyed. d. converted into another form.

_____14. A substance has a mass of 360 g and a volume of 7.5 cc. What is the correct way to set up the Density equation?
a. 360 g / 7.5 cc c. 7.5 cc / 360 g
b. 360 g – 7.5 cc

_____15. A substance has a mass of 360 g and a volume of 7.5 cm^3. What is its density?
a. 2700 g/cm^3 c. 480 g/cm^3
b. 270 g/cm^3 d. 48 g/cm^3

_____16.Ice floats in water because it is
a. more dense than water. c. colder than water.
b. less dense than water. d. warmer than water.

Completion

Complete each statement on the line provided.

17. When a metal changes color because it has been heated, a(an) _____ change occurred. When a metal changes color because it has reacted with another substance, a(an) _____ change occurred.

18. During vaporization, a substance changes from a(an) _____ to a(an) _____.

19. Evaporation is the process that changes a substance from a liquid to a gas at temperatures below the substance's _____ point.

20. Mass per unit volume is called: _____.

21. Matter can not be created or destroyed is the law of: _____ of _____

Short Answer

Melting and Boiling Points of Some Substances		
Substance	**Melting Point**	**Boiling Point**
Hydrogen	–259.3°C	–252.9°C
Nitrogen	–210.0°C	–195.8°C
Acetic acid	16.6°C	117.9°C
Gold	1064.2°C	2856°C

Figure 2-1

22. Based on the information in Figure 2-1, which substances would be solids at 10.0°C?

_____

23. Give an example of a physical change that can be reversed and an example of a physical change that cannot be reversed.

_____

_____

_____

24. What kind of change is taking place if you see white mold growing on a strawberry?

_____

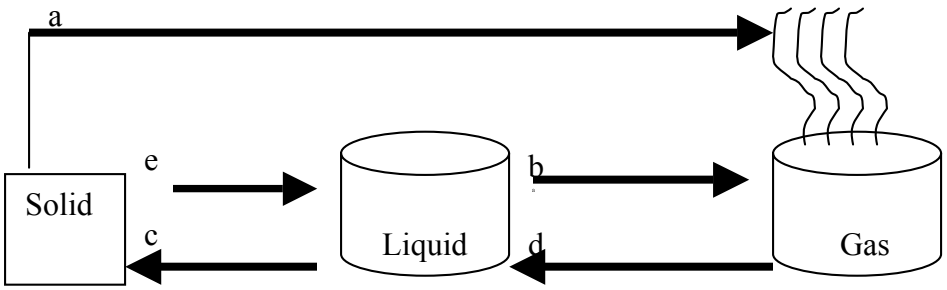
_____

25. During vaporization, a substance changes from a(an) _____ to a(an) _____.

26. Evaporation is the process that changes a substance from a liquid to a gas at temperatures below the substance's _____ point.

Reading and Diagram

27. Label the diagram with the following words:
Evaporation *Condensation* *Sublimation* *Freezing* *Melting*



Substance A Substance B Substance C

Figure 3-1

28. What substance in Figure 3-1 is a solid? Explain how you know.

_____

_____

_____

29. Describe what happens to the arrangement of water molecules as ice melts.

_____

_____

_____

Essay

Write the answer to each question on a separate sheet of paper.

30. Explain how you could use a physical property to test the purity of a silver coin without damaging the coin.

31. Suppose you want to separate the leaves, acorns, and twigs from a pile of soil. Filtration and distillation are two processes of separating mixtures. Explain which process you would use and why.

32. Suppose you heat a liquid and then gas bubbles are produced. With no other evidence, can you tell if a physical change or chemical change is occurring? Explain your answer.

33. Use billiard balls to describe the motion of particles in a gas. Use students in a crowded hallway to describe the motion of particles in a liquid. Use an audience in a movie theater to describe the motion of particles in a solid.

34. How does the kinetic theory relate to a substance being a solid, liquid or gas?

35. What are the 8 signs of a chemical reaction?