## Honors Chemistry CH 13 TEST <br> INSTRUCTIONS: This is an OPEN BOOK TEST BUT NO COLLABORATING Matching

Match each item with the correct statement below.
a. kinetic theory
d. barometer
b. atmospheric pressure
e. kinetic energy
c. vapor pressure

1. All matter consists of tiny particles that are in constant motion.
$\qquad$ 2. the energy an object has due to its motion
2. a device used to measure atmospheric pressure
3. the pressure resulting from the collision of atoms and molecules with objects
4. a measure of the force exerted by a gas above a liquid

## Multiple Choice

Identify the choice that best completes the statement or answers the question.
6. Which of the following statements is part of the kinetic theory?
a. The particles of a gas move independently of each other.
b. The particles in a gas move rapidly.
c. The particles in a gas are relatively far apart.
d. all of the above
$\qquad$ 7. Particles in a gas are best described as $\qquad$ .
a. slow-moving, kinetic, hard spheres
b. spheres that are in fixed positions when trapped in a container
c. small, hard spheres with insignificant volumes
d. hard spheres influenced by repulsive forces from other spheres
$\qquad$ 8. What instrument is normally used to measure atmospheric pressure?
a. thermometer
c. vacuum
b. barometer
d. manometer
$\qquad$ 9. What is the SI unit of pressure?
a. candela
c. pascal
b. mole
d. newton
10. What is one standard atmosphere of pressure in kilopascals?
a. 0 kPa
b. 760 kPa
c. $\quad 101.3 \mathrm{kPa}$
d. 1 kPa
11. Standard conditions when working with gases are defined as $\qquad$ .
a. 0 K and 101.3 kPa
b. 0 K and 1 kPa
c. $0^{\circ} \mathrm{C}$ and 101.3 kPa
d. $\quad 0^{\circ} \mathrm{C}$ and 1 kPa
12. What causes gas pressure in a container such as a helium balloon?
a. the walls of the container
b. the vacuum maintained in the container
c. the simultaneous collisions of fast-moving particles in the container
d. atmospheric pressure acting on the outside walls of the container
13. The pressure of a gas in a container is 152 mm Hg . This is equivalent to $\qquad$ .
a. 0.2 atm
b. 2 atm
c. 0.3 atm
d. $\quad 0.4 \mathrm{~atm}$
14. The temperature at which the motion of particles theoretically ceases is $\qquad$ .
a. -273 K
b. 0 K
c. $0^{\circ} \mathrm{C}$
d. $273^{\circ} \mathrm{C}$
15. What happens to the average kinetic energy of the particles in a sample of matter as the temperature of the sample is increased?
a. The average kinetic energy decreases.
b. The average kinetic energy increases.
c. The average kinetic energy does not change.
d. The change in average kinetic energy cannot be determined.
16. With which temperature scale is temperature directly proportional to average kinetic energy?
a. Celsius
c. Kelvin
b. Fahrenheit
d. centigrade
17. The average kinetic energy of the particles of a substance $\qquad$ .
a. is not affected by the temperature of the substance
b. increases as the temperature of the substance is lowered
c. is directly proportional to the temperature of the substance
d. is equal to the total energy absorbed by the substance
18. What happens to the temperature of a liquid as it evaporates?
a. It increases.
c. It does not change.
b. It decreases.
d. The change cannot be determined.
19. Which are the first particles to evaporate from a liquid?
a. particles with the lowest kinetic energy
b. particles with the highest kinetic energy
c. particles below the surface of the liquid
d. All particles evaporate at the same rate.
20. Why does a liquid's rate of evaporation increase when the liquid is heated?
a. More molecules have enough energy to overcome the attractive forces holding them in the liquid.
b. The average kinetic energy of the liquid decreases.
c. The surface area of the liquid is reduced.
d. The potential energy of the liquid increases.
21. In a dynamic equilibrium between the liquid state and the gas state, what is true about the rate of evaporation?
a. It is greater than the rate of condensation.
b. It is less than the rate of condensation.
c. It is equal to the rate of condensation.
d. The rate of evaporation cannot be determined.
22. Water could be made to boil at $105^{\circ} \mathrm{C}$ instead of $100^{\circ} \mathrm{C}$ by $\qquad$ .
a. adding a lot of energy to the water
c. decreasing the external pressure
b. increasing the external pressure
d. taking the sample to a higher altitude
23. The smallest group of particles in a crystal that retains the shape of the crystal is called the $\qquad$ .
a. cube
c. cage
b. unit cell
d. crystal lattice
24. The direct change of a substance from a solid to a gas is called $\qquad$ _.
a. evaporation
c. condensation
b. sublimation
d. solidification
25. How are conditions of pressure and temperature, at which two phases coexist in equilibrium, shown on a phase diagram?
a. by a line separating the phases
b. by the endpoints of the line segment separating the phases
c. by the planar regions between lines in the diagram
d. by a triple point on the diagram

## Short Answer

26. What is a pressure of 0.520 atm equal to in mm of Hg ?
27. What is a pressure of 622 mm Hg equal to in atm?
28. At what temperature do particles theoretically have no kinetic energy?

## Numeric Response

29. How many phases of water are in equilibrium at the triple point?

## Essay

30. Name three different allotropes of carbon and describe their physical properties.
