Quiz: Honors Chemistry Gas Laws and Conversions

Matching

Match each item with the correct statement below.

a. Boyle's law
b. Charles's law
c. Dalton's law
d. Graham's law
e. Gay-Lussac's law
f. ideal gas law

____ 1. For a given mass of gas at constant temperature, the volume of the gas varies inversely with pressure.

____ 2. The volume of a fixed mass of gas is directly proportional to its Kelvin temperature, if the pressure is kept constant.

____ 3. The pressure of a gas is directly proportional to its Kelvin temperature if the volume is kept constant.

Multiple Choice

Identify the choice that best completes the statement or answers the question.

____ 4. Why is a gas easier to compress than a liquid or a solid?
a. Its volume increases more under pressure than an equal volume of liquid does.
b. Its volume increases more under pressure than an equal volume of solid does.
c. The space between gas particles is much less than the space between liquid or solid particles.
d. The volume of a gas's particles is small compared to the overall volume of the gas.

____ 5. Why does the pressure inside a container of gas increase if more gas is added to the container?
a. There is an increase in the number of collisions between particles and the walls of the container.
b. There is an increase in the temperature of the gas.
c. There is a decrease in the volume of the gas.
d. There is an increase in the force of the collisions between the particles and the walls of the container.

____ 6. If the volume of a container of gas is reduced, what will happen to the pressure inside the container?
a. The pressure will increase.
b. The pressure will not change.
c. The pressure will decrease.
d. The pressure depends on the type of gas.

____ 7. If a balloon is squeezed, what happens to the pressure of the gas inside the balloon?
a. It increases.
b. It stays the same.
c. It decreases.
d. The pressure depends on the type of gas in the balloon.

____ 8. What happens to the temperature of a gas when it is compressed?
a. The temperature increases.
b. The temperature does not change.
c. The temperature decreases.
d. The temperature becomes unpredictable.

____ 9. What happens to the pressure of a gas inside a container if the temperature of the gas decreases?
a. The pressure increases.
b. The pressure does not change.
c. The pressure decreases.
d. The pressure cannot be predicted.

____ 10. Which of these changes would NOT cause an increase in the pressure of a contained gas?
a. The volume of the container is increased.
b. More of the gas is added to the container.
c. The temperature is increased.
d. The average kinetic energy of the gas in increased.

____ 11. When the Kelvin temperature of an enclosed gas doubles, the particles of the gas ____.
a. move faster
b. strike the walls of the container with less force
c. decrease in average kinetic energy
d. decrease in volume

____ 12. The volume of a gas is reduced from 4 L to 0.5 L while the temperature is held constant. How does the gas pressure change?
a. It increases by a factor of four.
b. It decreases by a factor of eight.
c. It increases by a factor of eight.
d. It increases by a factor of two.

____ 13. Boyle's law states that ____.
a. the volume of a gas varies inversely with pressure
b. the volume of a gas varies directly with pressure
c. the temperature of a gas varies inversely with pressure
d. the temperature of a gas varies directly with pressure

____ 14. Charles's law states that ____.
a. the pressure of a gas is inversely proportional to its temperature in kelvins
b. the volume of a gas is directly proportional to its temperature in kelvins
c. the pressure of a gas is directly proportional to its temperature in kelvins
d. the volume of a gas is inversely proportional to its temperature in kelvins

____ 15. If a balloon is heated, what happens to the pressure of the air inside the balloon if the volume remains constant?
a. It increases.
b. It stays the same.
c. It decreases.
d. The change cannot be predicted.

____ 16. A gas occupies a volume of 2.4 L at 14.1 kPa. What volume will the gas occupy at 84.6 kPa?
a. 497 L
b. 2.5 L
c. 14 L
d. 0.40 L

____ 17. A sample of gas occupies 17 mL at –112°C. What volume does the sample occupy at 70°C?
a. 10.6 mL
b. 27 mL
c. 36mL
d. 8.0mL

____ 18. In general, for a gas at a constant volume, ____.
a. the pressure of the gas is inversely proportional to its temperature in kelvins
b. the volume of the gas is inversely proportional to its temperature in kelvins
c. the volume of the gas is directly proportional to its temperature in kelvins
d. the pressure of the gas is directly proportional to its temperature in kelvins

____ 19. The combined gas law relates which of the following?

a. pressure and volume only
b. temperature and pressure only
c. volume and temperature only
d. temperature, pressure, and volume

____ 20. If a balloon containing 3000 L of gas at 39°C and 99 kPa rises to an altitude where the pressure is 45.5 kPa and the temperature is 16°C, the volume of the balloon under these new conditions would be calculated using the following conversion factor ratios: ____.

a. $3000\ \text{L} \times \frac{99}{45.5} \times \frac{16}{39}$
b. $3000\ \text{L} \times \frac{312}{289} \times \frac{45.5}{99}$
c. $3000\ \text{L} \times \frac{289}{312} \times \frac{99}{45.5}$
d. $3000\ \text{L} \times \frac{39}{16} \times \frac{45.5}{99}$

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Answer Section

MATCHING

1. ANS: A PTS: 1 DIF: L1 REF: p. 418
   OBJ: 14.2.1
2. ANS: B PTS: 1 DIF: L1 REF: p. 420
   OBJ: 14.2.1
3. ANS: E PTS: 1 DIF: L1 REF: p. 422
   OBJ: 14.2.1

MULTIPLE CHOICE

4. ANS: D PTS: 1 DIF: L2 REF: p. 413 | p. 414
   OBJ: 14.1.1
5. ANS: A PTS: 1 DIF: L1 REF: p. 415
   OBJ: 14.1.2
6. ANS: A PTS: 1 DIF: L1 REF: p. 416
   OBJ: 14.1.2
7. ANS: A PTS: 1 DIF: L1 REF: p. 416
   OBJ: 14.1.2
8. ANS: A PTS: 1 DIF: L1 REF: p. 416
   OBJ: 14.1.2
9. ANS: C PTS: 1 DIF: L1 REF: p. 417
   OBJ: 14.1.2
10. ANS: A PTS: 1 DIF: L2 REF: p. 415 | p. 416 | p. 417
    OBJ: 14.1.2
11. ANS: A PTS: 1 DIF: L1 REF: p. 417
    OBJ: 14.2.1
12. ANS: C PTS: 1 DIF: L1 REF: p. 418
    OBJ: 14.2.1
13. ANS: A PTS: 1 DIF: L1 REF: p. 418
    OBJ: 14.2.1
14. ANS: B PTS: 1 DIF: L1 REF: p. 420
    OBJ: 14.2.1
15. ANS: A PTS: 1 DIF: L1 REF: p. 422
    OBJ: 14.2.1
16. ANS: D PTS: 1 DIF: L2 REF: p. 419
    OBJ: 14.2.1
17. ANS: C PTS: 1 DIF: L2 REF: p. 421
    OBJ: 14.2.1
18. ANS: D PTS: 1 DIF: L2 REF: p. 422
    OBJ: 14.2.1
19. ANS: D PTS: 1 DIF: L1 REF: p. 424
    OBJ: 14.2.2
20. ANS: C PTS: 1 DIF: L2 REF: p. 419

OBJ: 14.2.2