Gas Laws Study Guide

Test Format:

Multiple choice and problems

Items that will be provided for the test (read important notes at the bottom):

Gas law equations*
The value of R
Pressure conversion factors
I will provide the equations on the test. You are responsible for knowing which laws the equations describe (ex: I will give you P₁ x V₁ = P₂x V₂ and you must know that this is Boyle's Law).

- 1) What is the name of the model we currently use to explain the behavior of gases? kinetic molecular theory (KMT).
- 2) Define the kinetic molecular theory (KMT). Gases are in constant motion with elastic collisions
- According to the KMT, do gas particles experience attractive or repulsive forces? Explain why or why not. Neither-they are too far apart.
- 5) Completely describe the motion of gas particles according to the KMT. Constant, Random, Straight paths, different velocity
- 6) Define clastic collision. No kinetic energy is lost-just transferred between parieles
- 7) What determines the kinetic energy of a particle? Mass and velocity
- 8) In a sample of a single gas, do all particles have the same kinetic energy? Explain why or why not. No they have a different velocity
- 9) Define temperature. Measurement of kinetic energy
- 10) Explain why gases have a low density. Lots of space between particles (large volume)
- 11) Why are gases compressible? Lots of empty space between particles
- 12) Why do gases expand to fill a container? No attractive or repulsive forces
- 13) Why can gas particles flow easily past each other? No attractive forces
- 14) Define diffusion. Movement of one material through another
- 15) Define effusion. Gas escapes through tiny openings
- 16) Describe how diffusion depends on the mass of the particles. Diffusion is dependent on mass, so less mass more diffusion
- 17) Use the KMT to explain why a balloon expands as you blow air into it. Particles are in constant motion and collide with their surroundings expanding the balloon.

Boyle's Law: Answer the following questions about Boyle's Law.

- 18) Describe Boyle's Law in your own words. As pressure increases, volume decreases
- 19) What is the formula? P₁V₁ = P₂V₂
- 20) What are the variables? What are the possible units used in the formula? Pressure and volume, atm, kPa, mL, L.
- 21) What is constant? temperature



- Give an example to help explain the law (you should have some type of visual of your example).
- 23) What would a graph of pressure vs. volume of a gas look like according to Boyle's Law?

Charles' Law: Answer the following questions about Charles' Law.

- 24) Describe Charles' Law in your own words. Increase temperature, increase volume
- 25) What is the formula? -
- 26) What are the variables? What are the possible units used in the formula? Temperature and volume (kelvin, mL, L)
- 27) What is constant? Pressure
- 28) What is very important to remember about the temperature variable when using this formula? It must be in kelvin
- 29) Give an example to help explain Charles's Law (you should have some type of visual of your example).



30) What would a graph of temperature vs. volume of a gas look like according to Charles's Law?

Gay-Lussac's Law: Answer the following questions about Gay-Lussac's Law.

- 31) Describe Gay-Lussac's Law in your own words. As pressure increases, temperature increases.
- 32) What is the formula? —
- 33) What are the variables? What are the possible units used in the formula? Pressure and temperature (kelvin, atm, kPa, torr)
- 34). What is constant? volume
- 35) What is very important to remember about the temperature variable when using this formula? It must be in kelvin
- 36) Give an example to help explain Gay-Lussac's Law (you should have some type of visual of your example).

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