

Name: _____

Date: _____

Notes: The Gas Law Equations

Kinetic-Molecular Theory

1. _____
2. _____
3. _____
4. _____

What are the 2 units for measuring temperature? _____

Define **absolute zero**: _____

Converting between Temperature Scales:

What units MUST be used in the gas laws? _____

Convert between the temperature scales below.

$156^{\circ}\text{C} = \underline{\hspace{2cm}} \text{ K}$

$250 \text{ K} = \underline{\hspace{2cm}} ^{\circ}\text{C}$

$-120^{\circ}\text{C} = \underline{\hspace{2cm}} \text{ K}$

$300 \text{ K} = \underline{\hspace{2cm}} ^{\circ}\text{C}$

$37^{\circ}\text{C} = \underline{\hspace{2cm}} \text{ K}$

$298 \text{ K} = \underline{\hspace{2cm}} ^{\circ}\text{C}$

Which law describes how the pressures of gases in a container add together?

1. What is the pressure inside a container if it contains Ne gas at a pressure of 350. kPa, CO₂ gas at a pressure of 175 kPa and N₂ gas at a pressure of 200. kPa? _____

2. CO₂, N₂ and He gas are inside of a container. The total pressure exerted by the gases is 10.0 atmospheres. The CO₂ exerts a pressure of 2.2 atm and the N₂ exerts a pressure of 4.6 atm. How much pressure is exerted by the helium gas? _____

Who discovered the relationship between pressure and volume? _____

How are pressure and volume related? _____

Who discovered the relationship between volume and temperature? _____

How are volume and temperature related? _____

Who discovered the relationship between volume and number of moles? _____

How are volume and number of moles related? _____

How do you change the Combined Gas Law into one of the simpler gas laws?

1. A container is filled with helium gas. It has a volume of 2 liters and is at a temperature of 20 °C. If the temperature of the container is increased to 35 °C without removing any of the gas or changing the pressure, what will the new volume be?

Equation:

Substitution:

Solution:

2. A container is filled with nitrogen gas. It has a volume of 1.0 liter and contains 0.25 mol of N₂. If the number of moles in the container were increased to 1.5 mol without changing the temperature or pressure, what will the new volume be?

Equation:

Substitution:

Solution:

3. A container is filled with neon gas. It has a volume of 2.5 L and a pressure of 202.6 kPa. If the volume of the container is increased to 6 L without removing any of the gas or changing the temperature, what will the new pressure be?

Equation:

Substitution:

Solution:

4. A container is filled with argon gas. It contain 20.0 mol of argon and is at a temperature of 22.0 °C. If the number of moles of argon in the container is halved without changing the pressure or volume, what will the new temperature be?

Equation:

Substitution:

Solution:

5. A container is filled with nitrogen gas. It has a volume of 15 liters and contains 1.5 moles of N₂. If the amount of nitrogen in the container were doubled without changing the temperature or pressure, what will the new volume be?

Equation:

Substitution:

Solution:

6. A container is filled with hydrogen gas. It has a volume of 2.0 liters and a pressure of 3.0 atm. If the pressure of the container is increased to 5.0 atm without removing any of the gas or changing the temperature, what will the new volume be?

Equation:

Substitution:

Solution:

7. A container is filled with helium gas. It has a volume of 8 liters and is at a temperature of 20 °C. If the temperature of the container is increased to 60 °C without removing any of the gas or changing the pressure, what will the new volume be?

Equation:

Substitution:

Solution:

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