**Gas Laws**

Practice Problems

1. Nitrous oxide (N2O) is used as an anesthetic. The pressure on 2.50 L of N2O changes from 105 kPa to 40.5 kPa. If the temperature does not change, what will the new volume be?

2. A gas with a volume of 4.00 L at a pressure of 205 kPa is allowed to expand to a volume of 12.0 L. What is the pressure in the container if the temperature remains constant?

3. If a sample of gas occupies 6.80 L at 325° C, what will its volume be at 25° C if the pressure does not change?

4. Exactly 5.00 L of air at -50.0° C is warmed to 100.0° C. What is the new volume if the pressure remains constant?

5. A gas at 155 kPa and 25° C has an initial volume of 1.00 L. The pressure of the gas increases to 605 kPa as the temperature is raised to 125° C. What is the new volume?

6. A 5.00 L air sample has a pressure of 107 kPa at a temperature of -50° C. It the temperature is raised to 102° C and the volume expands to 7.00 L, what will the new pressure be?

7. How are the pressure and volume of gas related at constant temperature?

8. If pressure is constant, how does a change in temperature affect the volume of a gas?

**Ideal Gas Law (PV=nRT)**

Practice problems

1. When the temperature of a rigid hollow sphere containing 685 L of helium gas is held at 621 K, the pressure of the gas is 1.89 x 103 kpa. How many mole of helium does the sphere contain?

2. A child’s lungs can hold 2.20L. How many grams of air do her lungs hold at a pressure of 102 kpa and a body temperature of 37°C? Use a molar mass of 29g for air.

3. What is an ideal gas?

4. Determine the volume occupied by 0.582 moles of gas at 15°C if the pressure is 81.8 kpa.

5. What pressure is exerted by 0.450 moles of a gas at 25°C, if the gas is in a 0.650L container?

6. Explain why it is impossible for an ideal gas to exist.

7. What volume will 12.0g of oxygen gas occupy at 25°C and a pressure of 52.7 kpa?

8. If 4.50 g of methane gas (CH4) is in a 2.00 L container at 35°C, what is the pressure in the container?

**Gas Laws**

Practice Problems

1. Nitrous oxide (N2O) is used as an anesthetic. The pressure on 2.50 L of N2O changes from 105 kPa to 40.5 kPa. If the temperature does not change, what will the new volume be?

**V = 6.48 L**

2. A gas with a volume of 4.00 L at a pressure of 205 kPa is allowed to expand to a volume of 12.0 L. What is the pressure in the container if the temperature remains constant?

**P = 68.3 kPa**

3. If a sample of gas occupies 6.80 L at 325° C, what will its volume be at 25° C if the pressure does not change?

**V = 3.39 L**

4. Exactly 5.00 L of air at -50.0° C is warmed to 100.0° C. What is the new volume if the pressure remains constant?

**V = 8.36 L**

5. A gas at 155 kPa and 25° C has an initial volume of 1.00 L. The pressure of the gas increases to 605 kPa as the temperature is raised to 125° C. What is the new volume?

**V = 0.342 L**

6. A 5.00 L air sample has a pressure of 107 kPa at a temperature of -50° C. It the temperature is raised to 102° C and the volume expands to 7.00 L, what will the new pressure be?

**P = 129 kPa**

7. How are the pressure and volume of gas related at constant temperature?

8. If pressure is constant, how does a change in temperature affect the volume of a gas?

**Ideal Gas Law (PV=nRT)**

Practice problems

1. When the temperature of a rigid hollow sphere containing 685 L of helium gas is held at 621 K, the pressure of the gas is 1.89 x 103 kpa. How many moles of helium does the sphere contain?

**n = 251 mol He**

2. A child’s lungs can hold 2.20L. How many grams of air do her lungs hold at a pressure of 102 kpa and a body temperature of 37°C? Use a molar mass of 29g for air.

**2.5 g air**

3. What is an ideal gas?

4. Determine the volume occupied by 0.582 moles of gas at 15°C if the pressure is 81.8 kpa.

**V = 17.0 L**

5. What pressure is exerted by 0.450 moles of a gas at 25°C, if the gas is in a 0.650L container?

**P = 1710 kPa**

6. Explain why it is impossible for an ideal gas to exist.

7. What volume will 12.0g of oxygen gas occupy at 25°C and a pressure of 52.7 kpa?

**n = 17.6 L**

8. If 4.50 g of methane gas (CH4) is in a 2.00 L container at 35°C, what is the pressure in the container?

**P = 3.60x102 kPa**