

Thermodynamics: Ideal Gases and Kinetic Theory

⚠ This is a preview of the draft version of the quiz

Started: Nov 4 at 9:33am

Quiz Instructions

Question 1

1 pts

If volume is held constant and you _____ the pressure on a gas, the temperature will _____.

- increase, not change
- increase, increase
- decrease, increase
- increase, decrease

Question 2

1 pts

At a constant temperature, if you _____ the pressure on a gas, the volume will _____.

- increase, not change

- decrease, decrease
- increase, decrease
- increase, increase

Question 3**1 pts**

An ideal gas is enclosed in a rigid container.

_____ the temperature of an enclosed gas _____ the velocity of particles, resulting in _____ collisions with the rigid container.

- Lowering | Increases | More
- Rasing | Decreases | More
- Lowering | Decreases | Less
- Raising | Increases | Less

Question 4**1 pts**

An ideal gas is enclosed in a rigid container.

If there are fewer collisions of gas molecules with the container also means a decrease in _____.

- the number of moles of gas in the container
- the volume of the container
- all of the above
- the pressure

Question 5**1 pts**

There are 6.0 moles of an ideal gas contained in a cube 1.5 m wide. The temperature is 30 K. What is the pressure in the cube? $R=8.314 \text{ J/molK}$

- 463Pa
- 503Pa
- 543Pa
- 443Pa

Question 6**1 pts**

Choose the two statements below that are true for a system at a constant temperature.

- In order to decrease the volume of a gas, work must be done on the gas.

- In order to decrease the volume of a gas, work must be done by the gas.
- An increase in the pressure of the system will not change the volume of it.
- An increase in the pressure of the system will requires an increase in the volume.
- An increase in the volume of the system will result in a decrease in the pressure.

Question 7**1 pts**

There are 3.0 moles of an ideal gas at 75 degrees C in a cubic box that measures 30 cm on each side. What is the force on one side of the box in kN? $R=8.314 \text{ J/molK}$.

- 25kN
- 31kN
- 27kN
- 29kN

Question 8**1 pts**

Which of the following will cause the largest increase in the pressure of an ideal gas in a container?

- decreasing the temperature of the gas by a factor of 2

- decreasing the amount of gas in the container
- doubling the temperature of the gas
- doubling the volume of the container

Question 9**1 pts**

Consider a piston that is being moved by an expanding gas using thermal energy from a heat source as shown in the content video for the previous section. If the chamber initially contains 0.001 m^3 of hydrogen at 1 atm and 22 degrees C and the piston is free to move, then:

how much work is done **by** the gas to double the volume of hydrogen in the chamber?

- 101.3J
- 141.3J
- 81.3J
- 121.3J

Question 10**1 pts**

Consider a piston that is being moved by an expanding gas using thermal energy from a heat source as shown in the content video for the previous section. If the chamber initially contains 0.001 m^3 of hydrogen at 1 atm and 22 degrees C and the piston is free to move, then:

What is the corresponding increase in temperature of the hydrogen in the chamber?

295K

321K

442K

387K

Question 11

1 pts

A spherical balloon with a diameter of 25 cm at atmospheric pressure and 27 degrees C contains helium. What is the balloon's change in volume in m^3 when it is put in a freezer at $-3^\circ C$? Assume the pressure remains constant.

3.5×10^{-4}

8.2×10^{-4}

3.5×10^{-5}

8.2×10^{-5}

Question 12

1 pts

There are 314,159,265 particles of an ideal gas in a sphere of radius 1.0 mm. What is the temperature of the particles if their pressure is 0.01 Pa?

7,222K

8,976K

9,001K

9,662K

Not saved

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