Name: KEY

Gas Law Station

1.) Under which conditions does a real gas behave most like an ideal gas?

4

(1) at low temperatures and high pressures
(2) at low temperatures and low pressures
(3) at high temperatures and high pressures
(4) at high temperatures and low pressures

2.) The kinetic molecular theory assumes that the particles of an ideal gas

1

(1) are in random, constant, straight-line motion
(2) are arranged in a regular geometric pattern
(3) have strong attractive forces between them
(4) have collisions that result in the system losing energy

3.) A sample of a gas is contained in a closed rigid cylinder. According to kinetic molecular theory, what occurs when the gas inside the cylinder is heated?

3

(1) The number of gas molecules increases.
(2) The number of collisions between gas molecules per unit time decreases.
(3) The average velocity of the gas molecules increases.
(4) The volume of the gas decreases.

4.) According to the kinetic molecular theory, the molecules of an ideal gas

3

(1) have a strong attraction for each other
(2) have significant volume
(3) move in random, constant, straight-line motion
(4) are closely packed in a regular repeating pattern

5.) According to the kinetic molecular theory, which statement describes the particles in a sample of an ideal gas?

2

(1) The force of attraction between the gas particles is strong.
(2) The motion of the gas particles is random and straight-line.
(3) The collisions between the gas particles cannot result in a transfer of energy between the particles.
(4) The separation between the gas particles is smaller than the size of the gas particles themselves.

6.) Which gas sample at STP has the same total number of molecules as 2.0 liters of $CO_2(g)$ at STP?

2

(1) 5.0 L of $CO_2(g)$
(2) 2.0 L of $Cl_2(g)$
(3) 3.0 L of $H_2S(g)$
(4) 6.0 L of He(g)

7.) At 25°C, gas in a rigid cylinder with a movable piston has a volume of 145 mL and a pressure of 125 kPa. Then the gas is compressed to a volume of 80. mL. What is the new pressure of the gas if the temperature is held at 25°C?

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(1) 69 kPa
(2) 93 kPa
(3) 160 kPa
(4) 230 kPa

$$\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2} \qquad \frac{125\,kPa \times 145mL}{298K} = \frac{x \cdot 80mL}{298K}$$

$P_1 = 125\,kPa$ $\quad P_2 = x$

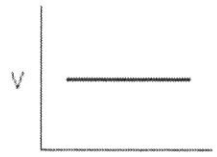
$V_1 = 145mL$ $\quad V_2 = 80mL$

$T_1 = 25°C \rightarrow 298K$ $\quad T_2 = 298K$

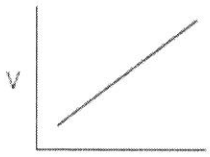
OVER

8.) Which graph best represents the pressurevolume relationship for an ideal gas at constant temperature?

4



(1)



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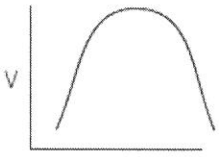
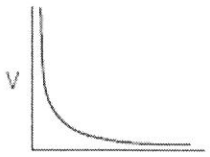


(3)



(4)

Base your answers to question 9 on the diagram below, which shows a piston confining a gas in a cylinder.

9.) Using the set of axes provided *below,* sketch the general relationship between the pressure and the volume of an ideal gas at constant temperature.