#### **General Chemistry Multiple Choice Questions Chapter 9** 1 Which of the following is not a property of a gas under normal conditions? 9.1 **a** Flows easily **b** Compressible c Completely fills its container d High Density 2 A real gas typically exhibits behavior that is closest to an ideal gas at 9.1 High pressure and high temperature **b** High pressure and low temperature c Low pressure and low temperature **d** Low pressure and high temperature **3** Which of the following statements is true according to the kinetic molecular theory? 9.1 Gravitational forces act upon gas particles **b** Average KE of gas particles is proportional to K temp **c** Gas particles exert forces upon each other **d** Gas particles have measurable volumes 4 Under which of the following conditions of temperature and pressure will H<sub>2</sub> gas be expected to behave 9.1 most like an ideal gas? **a** 50 K and 0.10 atm **b** 50 K and 5.0 atm c 500 K and 0.10 atm **d** 500 K and 50 atm

5 The average volume of a sample of air in a cylinder with a movable piston is 2.0 L at a pressure P<sub>1</sub>

The volume is increased to 5.0 L as the temperature is held constant. The pressure of the air in the cylinder is now  $P_2$ . What effect do the volume and pressure changes have on the average kinetic energy

is affected without knowing P<sub>1</sub> and P<sub>2</sub>

**b** The average kinetic energy decreases

**d** It cannot be determined how the kinetic energy

of the molecules in the sample?

a The average kinetic energy increases

**c** The average kinetic energy stays the same

9.1

1	What is the SI unit for pressure?		9.2
а	Pascal	<b>b</b> Atmosphere	9.2
С	Pounds per Square Inch	<b>d</b> mm Hg	
2	If the pressure stays constant but the surface area exposed increases, the force		9.2
а	Increases	<b>b</b> Decreases	<b>5.</b> _
С	No Change	<b>d</b> Not enough information to determine	
3	If the pressure increases and the surface area exposed stays constant, the force		9.2
а	Increases	<b>b</b> Decreases	3.2

**d** Not enough information to determine

c No Change

1	The pressure of a gas is measured using a U-shaped manometer. The height of the mercury in the manometer is 13 cm on the side connected to the sample and 26 cm on the side connected to the			9.3
	atmosphere. Atmospheric pressure is 752 torr. What is the gas pressure of the sample?			
а	882 torr	<b>b</b> 765 torr		
С	752 torr	<b>d</b> 622 torr		
2	2 One atmosphere of pressure is equal to how many pascals?			0.2
а	101 300 Pa	<b>b</b> 10 130 Pa		9.3
C	100 000 Pa	<b>d</b> 10 000 Pa		
3	What is 56500 Pa in millimeters of mercury?			0.2
а	429 mm Hg	<b>b</b> 434 mm Hg		9.3

**d** 439 mm Hg

c 424 mm Hg

1	What is the volume at STP of 6.2 moles of carbon dioixide gas?		9.4
а	140 L	<b>b</b> 14 L	5.4
С	150 L	<b>d</b> 15 L	
2	2 How many moles of nitrogen gas at STP are there in 35.2 liters?		9.4
а	1.54 mol	<b>b</b> 1.57 mol	J. <del>4</del>
С	1.40 mol	<b>d</b> 1.67 mol	
3	What is the volume at STP of the resulting hydrogen gas when 2 moles of HCl react with excess Mg?		9.4
а	44.8 L	<b>b</b> 55.9 L	5.4

**d** 22.4 L

c 11.2 L

Which of the following is a statement of Boyle's Law?
V = kn (P, T constant)
P = kT (V, n constant)
V = kT (n, P constant)
A gas at 30°C and 1 atm pressure has a volume of 3.50 L. What volume is the gas at 40°C and 1 atm?
2.63 L
3.39 L
4 3.62 L
A sample of gas at 750 torr and a temperature of -50°C and a volume of 3.00 L is allowed to change so that the temperature is 200°C and gas pressure is 845 torr. What is the new volume?

**b** 1.26 L

**d** 0.499 L

**a** 5.65 L

**c** 7.17 L

1 A 2L sample of  $N_2$  (g) and a 1 L sample of Ar (g), each originally at 1 atm and 0°C, are combined in a 1L tank. If the temperature is held constant, what is the total pressure of the gases in the tank?



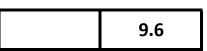
a 1 atm

**b** 2 atm

**c** 3 atm

**d** 4 atm

**2** A sealed container contains 1.0 mol of hydrogen and 2.0 moles of nitrogen gas. If the total pressure in the container is 1.5 atm, what is the amount of pressure exerted by each gas?



**a**  $H_2 = 1.0$  atm and  $N_2 = 0.50$  atm

**b**  $H_2 = 0.5$  atm and  $N_2 = 1.0$  atm

**c**  $H_2 = 1.0$  atm and  $N_2 = 2.0$  atm

**d**  $H_2 = 2.0$  atm and  $N_2 = 1.0$  atm

3 A sample of  $H_2$  gas is collected by water displacement. The atmospheric pressure in the room is 757 mm Hg and the vapor pressure of water is 17 mm Hg. What is the partial pressure of hydrogen here?

9.6

a 17 mm Hg

**b** 740 mm Hg

**c** 757 mm Hg

**d** 774 mm Hg

1	How many moles of hydrogen gas are in a sample of H	$ m H_{2}$ gas with a volume of 9.00 L at a temperature of	9.7
	100°C and at a pressure of 2.00 atm?		9.7
а	2.19 moles	<b>b</b> 0.588 moles	
С	0.429 moles	<b>d</b> 0.0289 moles	
2	What is the gas density of C <sub>2</sub> H <sub>2</sub> at STP in units of g/L?		9.7
а	2.12 g/L	<b>b</b> 1.83 g/L	9.7
С	1.16 g/L	<b>d</b> 0.850 g/L	
3	43.2 g of a gas occupies 22.4 L at 200°C and 2.00 atm.	What is its molar mass?	9.7
а	49.9 g/mol	<b>b</b> 37.6 g/mol	9.7
С	21.6 g/mol	<b>d</b> 13.2 g/mol	
4	Which flask contains the smallest number of moles of	0.7	
а	Flask 1: N <sub>2</sub> , 30°C, 1 atm	<b>b</b> Flask 2: N <sub>2</sub> , 50°C, 0.5 atm	9.7
С	Flask 3: O <sub>2</sub> , 40°C, 2 atm	<b>d</b> Flask 4: O <sub>2</sub> , 50°C, 1 atm	
e	Flask 5: O <sub>2</sub> , 40°C, 0.5 atm		
5 A scuba diving tank is filled with 42 L of $O_2$ at 1.00 atm and 10 L of He at 1.00 atm and 27°C. The tank has			0.7
	a total volume of 6.0 L. What is the total pressure in the scuba tank at 25°C?		9.7
а	5.3 atm	<b>b</b> 8.6 atm	

**d** 12.6 atm

**c** 10.3 atm

1	Which of these statements is true?				9.8
а	The vapor pressure of a liquid increases with decreasing temperature				3.0
b	<b>b</b> The boiling point of a liquid is independent of atmospheric pressure				
С	Vapor pressure varies directly with volume				
d	The higher the boiling point of a liquid at 1 atm atmospheric pressure, the greater the internal cohesive forces of the liquid.				
2	The boiling point is the temperature at which the substance's equals atmospheric pressure				0.0
а	Vapor pressure	<b>b</b> Internal Pressure			9.8
С	Molar Mass	<b>d</b> Surface Pressure			
3	The boiling point of a substance with e	levation			9.8
а	Increases	<b>b</b> Decreases			3.0
С	Doesn't Change	<b>d</b> Varies			

1 A sample of KClO<sub>3</sub> is heated and decomposed as follows:

$$2KCIO_3$$
 (s) --->  $2KCI$  (s) +  $3O_2$  (g)

9.9

9.9

9.9

If 3.00 g of KClO<sub>3</sub> is totally decomposed and the evolved  $O_2$  collected in a 1.00 L vessel at 22°C, what pressure will the  $O_2$  exert?

**a** 0.245 atm

**b** 0.389 atm

**c** 0.811 atm

- **d** 0.889 atm
- **2** What is the total volume of gas, in liters, at 520°C and 880 torr that would result from the decomposition of 33 g of potassium bicarbonate according to the following equation:

$$2 \ KHCO_{3}(s) --> K_{2}CO_{3}(s) + CO_{2}(g) + H_{2}O(g)$$

**a** 56 L

**b** 37 L

**c** 10. L

**d** 19 L

- e 12 L
- 3 Calculate the weight of  $KCIO_3$  that would be required to produce 29.5 L of oxygen at 127°C and 760 torr:

$$2 \ KClO_3(s) \longrightarrow 2 \ KCl(s) + 3 \ O_2(g)$$

**a** 7.82 g

**b** 12.2 g

**c** 14.6 g

**d** 24.4 g

**e** 73.5 g