1. What is **NOT** true about Kinetic Theory regarding gas particles?

* 1. The volume of gas particles in a piston increases as temperature increases.
	2. Gas particles do not collide
	3. The average kinetic energy of the gas particles is directly proportional to Kelvin temperature
	4. Gas particles move rapidly.

**C9.C-S**

1. Ideal Gas Law constant = 8.31 $\frac{dm3 ∙ kPa}{K ∙ mol}$

How many moles of CO2 are there in a 50.0 dm3 sample of the gas at a pressure of 100.0 kPa and a temperature of 50 °C?

1. 1.20 moles
2. 1.86 moles
3. 2.0 moles
4. 12.0 moles

**C.9.A-R**

1. What characteristic do liquids and gases share that solids do not?
	1. Definite shape
	2. Definite volume
	3. Indefinite shape
	4. Indefinite volume

**C.4.C-S**

1. A balloon is filled with 3.8 L of helium gas at STP. Approximately how many moles of helium are contained in the balloon?
2. 0.17 mol
3. 72 mol
4. 85 mol
5. 0.26 mol

**C.9.B-S**

1. A gas has a volume of 50.0 cm3 at a temperature of -73 °C. What volume would the gas occupy at a temperature of -123 °C if the pressure stays constant?
	1. 3.75 cm3
	2. 5.0 cm3
	3. 37.5 cm3
	4. 50.0 cm3

**C.9.A-R**

1. A sample of nitrogen gas is collected over water at 20 °C. The vapor pressure of water at 20 °C is 18 mmHg. What is the partial pressure of the nitrogen if the total pressure is 765 mmHg?
2. 18 mmHg
3. 747 mmHg
4. 765 mmHg
5. 783 mmHg

**C.9.A-R**

1. One way to increase the volume of the gas in the balloon in the diagram below is to —



* 1. cool the gas in the balloon only
	2. increase the temperature of the water
	3. push the balloon farther down into the water bath
	4. seal the top of the water bath

**C.9.A-R**

1. If the pressure exerted on a confined gas is doubled, then the volume of the gas —
2. increases four times
3. decreases by one-fourth
4. is doubled
5. is halved

**C.9.A-R**

1. A sample of oxygen gas is collected over water at 22 °C and 98.67 kPa pressure. If the partial pressure of the water is 2.67 kPa, the partial pressure of the oxygen is —
	1. 93.33 kPa
	2. 96.00 kPa
	3. 98.66 kPa
	4. 101.33 kPa

**C.9.A-R**

1. A tank contains N2 at 1.0 atm and O2 at 2.0 atm. Helium is added to this tank until the total pressure is 6.0 atm. What is the partial pressure of the helium?
2. 4.0 atm
3. 3.0 atm
4. 2.0 atm
5. 1.0 atm

 **C.9.A-R**

1. Which of the following statements is true?



1. particles of a gas never collide
2. particles of a gas collide with their container only.
3. particles of a gas collide with each other in elastic collisions.
4. particles of a gas collide with each other in inelastic collisions.

**C.9.C-S**

1. A gas cylinder with a volume of 3.00 dm3 contains 8.00 moles of oxygen gas at a temperature

of 50.0 K. What is the pressure inside the cylinder? $ R=8.31\frac{kPa •dm^{3}}{moles • K}$

1. 504 kPa
2. 1110 kPa
3. 2220 kPa
4. 3320 kPa

**C.9.A-R**

1. According to this balanced chemical equation, what volume of C2H2 is required to form 40.0 L of CO2?

**2C2H2 (*g*) + 5O2 (*g*) → 2H2O (*g*) + 4CO2 (*g*)**

1. 20.0 L
2. 44.8 L
3. 80.0 L
4. 100 L

**C.9.B-S**

1. A sample of a gas is in a cylinder as shown. If the temperature is kept constant and the piston moves down to decrease the volume, the pressure increases because the gas particles —
2. expand
3. lose velocity within the container
4. become smaller
5. collide more frequently with the container

**C.9.A-R**

1. A container with two gases, helium and argon, is 30.0% by volume helium. Calculate the partial pressure of helium and argon if the total pressure inside the container is 4.00 atm.

* 1. .082 atm
	2. 3.29 atm
	3. 4.00 atm
	4. 2.80 atm

**C.9.A-R**

1. Aluminum reacts with oxygen gas to form aluminum oxide, as shown in the reaction below.

**4Al (*s*) + 3O2 (*g*) → 2Al2O3 (*s*)**

How many grams of aluminum are needed to completely react with 192 g of oxygen gas?

1. 27.0 g
2. 102 g
3. 216 g
4. 432 g

 **C.9.B-S**

1. A man heats a balloon in the oven. If the balloon initially has a volume of 0.40 liters and a temperature of 20oC, what will the volume of the balloon be after he heats it to a temperature of 250oC?
	1. 32 L
	2. .87 L
	3. .71 L
	4. 9 L

**C.9.A-R**

1. In a laboratory activity, a student is working with an unknown substance, and observed the following characteristics.
	* 1. The substance takes the shape of its container.
		2. The substance cannot be compressed.
		3. The substance has a definite volume.

What is the conclusion that can be made about the state of matter of this substance?

1. The substance is a gas.
2. The substance is a liquid.
3. The substance is a solid.
4. The substance is plasma.

 **C.4.C-S**

1. A container holds three gases: oxygen, carbon dioxide, and helium. The partial pressures of the three gases are 2.00 atm, 3.00 atm, and 4.00 atm, respectively. What is the total pressure inside the container?

* 1. 9.00 atm
	2. 12.00atm
	3. 18.0 atm
	4. 24.0 atm

**C.9.A-R**

1. A cylinder with a movable piston contains 2.00 g of helium, He, at room temperature. More helium was added to the cylinder and the volume was adjusted so that the gas pressure remained the same. How many grams of helium were added to the cylinder if the volume was changed from 2.00 L to 2.70 L? (The temperature was held constant.)
2. 70 g
3. 0.007 g
4. 0.7 g
5. 79 g

**C.9.A-S**

Unit 7 States of Matter and Behavior of Gases Key

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item Number** | **Correct Answer** | **Readiness or Supporting** | **Content Student Expectation** | **Process Student Expectation** |
| 1 | B | S | C.9.C |  |
| 2 | G | R | **C.9.A** |  |
| 3 | C | S | C.4.C |  |
| 4 | F | S | C.9.B |  |
| 5 | C | R | **C.9.A** |  |
| 6 | G | R | **C.9.A** |  |
| 7 | B | R | **C.9.A** |  |
| 8 | J | R | **C.9.A** |  |
| 9 | B | R | **C.9.A** |  |
| 10 | G | R | **C.9.A** |  |
| 11 | C | S | C.9.C |  |
| 12 | G | R | **C.9.A** |  |
| 13 | A | S | C.9.B |  |
| 14 | J | R | **C.9.A** |  |
| 15 | D | R | **C.9.A** |  |
| 16 | H | S | C.9.B |  |
| 17 | C | R | **C.9.A** |  |
| 18 | G | S | C.4.C | C.2.I |
| 19 | A | R | **C.9.A** |  |
| 20 | H | R | **C.9.A** |  |