

CHAPTER 11 REVIEW*Gases***SECTION 3****SHORT ANSWER** Answer the following questions in the space provided.

1. _____ The molar mass of a gas at STP is the density of that gas
- (a) multiplied by the mass of 1 mol. (c) multiplied by 22.4 L.
(b) divided by the mass of 1 mol. (d) divided by 22.4 L.
2. _____ For the expression $V = \frac{nRT}{P}$, which of the following will cause the volume to increase?
- (a) increasing P (c) increasing T
(b) decreasing T (d) decreasing n
3. Two sealed flasks, A and B, contain two different gases of equal volume at the same temperature and pressure.
- _____ a. The two flasks must contain an equal number of molecules. True or False?
- _____ b. The two samples must have equal masses. True or False?

PROBLEMS Write the answer on the line to the left. Show all your work in the space provided.

4. Use the data in the table below to answer the following questions.

Formula	Molar mass (g/mol)
N ₂	28.02
CO	28.01
C ₂ H ₂	26.04
He	4.00
Ar	39.95

(Assume all gases are at STP.)

- _____ a. Which gas contains the most molecules in a 5.0 L sample?
- _____ b. Which gas is the least dense?
- _____ c. Which two gases have virtually the same density?
- _____ d. What is the density of N₂ measured at STP?

SECTION 3 continued

- _____ a. How many moles of methane, CH_4 are present in 5.6 L of the gas at STP?
- _____ b. How many moles of gas are present in 5.6 L of any ideal gas at STP?
- _____ c. What is the mass of the 5.6 L sample of CH_4 ?
- 6.** _____ a. A large cylinder of He gas, such as that used to inflate balloons, has a volume of 25.0 L at 22°C and 5.6 atm. How many moles of He are in such a cylinder?
- _____ b. What is the mass of the He calculated in part a?
- 7.** When C_3H_4 combusts at STP, 5.6 L of C_3H_4 are consumed according to the following equation:
- $$\text{C}_3\text{H}_4(g) + 4\text{O}_2(g) \rightarrow 3\text{CO}_2(g) + 2\text{H}_2\text{O}(l)$$
- _____ a. How many moles of C_3H_4 react?
- _____ b. How many moles of O_2 , CO_2 , and H_2O are either consumed or produced in the above reaction?
- _____
- _____
- _____ c. How many grams of C_3H_4 are consumed?
- _____ d. How many liters of CO_2 are produced?
- _____ e. How many grams of H_2O are produced?

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 (b) divided by the mass of 1 mol. (d) divided by 22.4 L.
2. c For the expression $V = \frac{nRT}{P}$, which of the following will cause the volume to increase?
 (a) increasing P (c) increasing T
 (b) decreasing T (d) decreasing n
3. Two sealed flasks, A and B, contain two different gases of equal volume at the same temperature and pressure.
- True a. The two flasks must contain an equal number of molecules. True or False?
- False b. The two samples must have equal masses. True or False?

PROBLEMS Write the answer on the line to the left. Show all your work in the space provided.

4. Use the data in the table below to answer the following questions.

Formula	Molar mass (g/mol)
N ₂	28.02
CO	28.01
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He	4.00
Ar	39.95

(Assume all gases are at STP.)

- all five gases a. Which gas contains the most molecules in a 5.0 L sample?
- He b. Which gas is the least dense?
- CO and N₂ c. Which two gases have virtually the same density?
- 1.25 g/L d. What is the density of N₂ measured at STP?

SECTION 3 continued

5. 0.25 mol a. How many moles of methane, CH₄ are present in 5.6 L of the gas at STP?

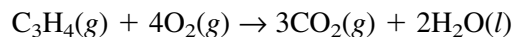
0.25 mol b. How many moles of gas are present in 5.6 L of any ideal gas at STP?

4.0 g c. What is the mass of the 5.6 L sample of CH₄?

6. 5.8 mol a. A large cylinder of He gas, such as that used to inflate balloons, has a volume of 25.0 L at 22°C and 5.6 atm. How many moles of He are in such a cylinder?

23 g b. What is the mass of the He calculated in part a?

7. When C₃H₄ combusts at STP, 5.6 L of C₃H₄ are consumed according to the following equation:



0.25 mol a. How many moles of C₃H₄ react?

1.0 mol of O₂ b. How many moles of O₂, CO₂, and H₂O are either consumed or produced in the above reaction?

0.75 mol of CO₂

0.50 mol of H₂O

10. g c. How many grams of C₃H₄ are consumed?

17 L d. How many liters of CO₂ are produced?

9.0 g e. How many grams of H₂O are produced?