

Gases Practice Test

- Convert 3.6×10^2 atm to torr.
 - 13,000 torr
 - 25 torr
 - 0.47 torr
 - 270,000 torr
 - 53,000 torr
- A gas occupies a volume of 202 mL at a pressure of 505 torr. To what pressure must the gas be subjected in order to change the volume to 65.0 mL? Assume constant temperature.
- A balloon has a volume of 1.20 L at 24.0°C . The balloon is heated to 48.0°C . Calculate the new volume of the balloon.
 - 1.20 L
 - 1.70 L
 - 1.30 L
 - 2.10 L
 - 2.40 L
- A sample of helium gas occupies 2.65 L at 1.20 atm. What pressure would this sample of gas exert in a 1.50 L container at the same temperature?
 - 2.12 atm
 - 1.20 atm
 - 3.31 atm
 - 0.679 atm
 - None of the above
- The lowest possible temperature that can be reached is
 - 273°C
 - 0°C
 - 273 K
 - -273°C
 - 273 K
- If the temperature of an ideal gas is raised from 100°C to 200°C , while the pressure remains constant, the volume
 - remains the same
 - increases by a factor of 100
 - doubles
 - goes to $1/2$ the original volume
 - None of the above
- Which of the following will give a graph with a straight line and a y-intercept of 0?
 - volume vs. temperature (K)
 - volume vs. $1/\text{temperature}$ ($^\circ\text{C}$)
 - volume vs. temperature ($^\circ\text{C}$)
 - volume vs. $1/\text{temperature}$ (K)
 - None of the above

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8. If temperature and pressure are held constant, the volume and number of moles of a gas are
- inversely proportional
 - not enough information given
 - directly proportional
 - equal
 - independent of each other
9. One mole of CO_2 at STP will occupy
- 44 L
 - 1.0 L
 - 22.4 L
 - 24.5 L
 - 44 g
10. What do the initials STP stand for, and what are the numerical values of each?
11. A 4.40-g piece of solid CO_2 (dry ice) is allowed to vaporize (change to $\text{CO}_2(g)$) in a balloon. The final volume of the balloon is 1.00 L at 300. K. What is the pressure of the gas?
- 2.46 atm
 - 0.122 atm
 - 246 atm
 - 122 atm
 - None of the above
12. C_2H_4 reacts with O_2 according to the following equation:
- $$\text{C}_2\text{H}_4(g) + 3\text{O}_2(g) \rightarrow 2\text{CO}_2(g) + 2\text{H}_2\text{O}(g)$$
- What volume of oxygen at STP is needed to react with 1.50 mol of C_2H_4 ?
- 67.2 L
 - not enough information given
 - 101 L
 - 33.6 L
 - 4.50 L
13. An oxygen sample has a volume of 4.50 L at 27°C and 800.0 torr. How many oxygen molecules does it contain?
- 1.16×10^{22}
 - 1.16×10^{23}
 - 5.8×10^{22}
 - 2.32×10^{24}
 - None of the above
14. A mole of a gas at STP has a volume of 22.4 L. If the volume increases to 29.1 L and the pressure is changed to 813 torr, calculate the new temperature.
- 226 K
 - 461 K
 - 379 K
 - 792 K
 - 519 K

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Use the following information to answer the next question(s):

A gas occupies 30. L at 2.0 atm pressure and 27°C.

15. How many moles of gas are present in the sample?

- A. 1.2 mol
- B. 4.8 mol
- C. 6.8 mol
- D. 9.2 mol
- E. 2.4 mol

Answer Sheet

1. **D.** 270,000 torr
2. 1570 torr; 2.07 atm
3. **C.** 1.30 L
4. **A.** 2.12 atm
5. **D.** -273°C
6. **E.** None of the above
7. **A.** volume vs. temperature (K)
8. **C.** directly proportional
9. **C.** 22.4 L
10. standard temperature = 273 K
pressure = 1 atm
11. **A.** 2.46 atm
12. **C.** 101 L
13. **B.** 1.16×10^{23}
14. **C.** 379 K
15. **E.** 2.4 mol

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Standards Summary

- CA 4.c Students know how to apply the gas laws to relations between the pressure, temperature, and volume of any amount of an ideal gas or any mixture of ideal gases.
- CA 4.d Students know the values and meanings of standard temperature and pressure (STP).
- CA 4.e Students know how to convert between the Celsius and Kelvin temperature scales.
- CA 4.f Students know there is no temperature lower than 0 Kelvin.
- CA 4.h* Students know how to solve problems by using the ideal gas law in the form $PV=nRT$.