

1. A sample of gas has a volume of 505 mL at a pressure of 705 torr. What volume will the gas occupy at the same temperature and a pressure of 755 torr?

Ans: 472 mL

2. Calculate the equivalent of 0.546 atm in millimeters of mercury, and in torr.

Ans: 415 mm Hg, 415 torr

3. What volume of air at 1.00 atm would have to be put into a bicycle tire with a volume of 1.00 L, if the pressure in the bicycle tire is to be 4.42 atm?

Ans: 4.42 L

4. A sample of gas has a volume of 252 mL at a pressure of 641 torr. What volume will the gas occupy at the same temperature and a pressure of 760 torr?

Ans: 213 mL

5. A 2500-L sample of oxygen gas is produced at 1.00 atm pressure. It is then compressed and stored in a 25.0-L steel cylinder. Calculate the pressure of the oxygen in the cylinder.

Ans: 100 atm

6. When 4.0 mol of oxygen are confined in a 20-L vessel at 76°C, the pressure is 6 atm. What is the new pressure when the oxygen is transferred to a 60-L vessel, at constant temperature?

A) 2 atm B) 3 atm C) 4 atm D) 8 atm

Ans: A

7. The pressure on a 500.0-mL gas sample changes from 760. mm Hg to 800. mm Hg. What is the new volume, assuming all other factors remain constant?

A) 425 mL B) 475 mL C) 525 mL D) 595 mL

Ans: B

8. A gas occupies a volume of 525 mL at a pressure of 1.00 atm. What is the new volume of the gas when the pressure is doubled?

A) 104 mL B) 263 mL C) 345 mL D) 760 mL

Ans: B

9. A sample of neon, maintained at constant temperature, occupies a volume of 0.500 L at 2.00 atm. What is the new volume when the pressure changes to 4.00 atm?

A) 0.250 L B) 0.500 L C) 1.50 L D) 6.00 L

Ans: A

10. When 400 mL of gas at 25°C expands to 1200 mL at constant pressure, the resulting temperature of the gas is:

A) 75°C B) 99°C C) 621°C D) 894°C

Ans: C

11. If a certain number of moles of gas occupies a volume of 198 mL at 25.0°C, what volume will the gas occupy when heated to 43.0°C at constant pressure?

A) 120 mL B) 210 mL C) 230 mL D) 320 mL

Ans: B

12. Calculate the volume of a 3.0-L gas sample at 1.00 atm and 0.0°C after it is heated to 85°C, assuming the pressure remains constant.

Ans: 3.9 L

13. A sample of hydrogen gas in a closed container has a temperature of 27°C and a pressure of 1.0 atm. What is the new pressure when the sample is heated to 127°C?

A) 0.67 atm B) 0.75 atm C) 1.3 atm D) 4.0 atm

Ans: C

14. A gas has a pressure of 681 torr at 43.0°C. What is the new pressure of the gas when the temperature rises to 55.0°C, assuming volume remains constant?

A) 374 torr B) 707 torr C) 735 torr D) 870 torr

Ans: B

15. The pressure of a gas at 298 K is 1 atm. What is the new temperature when the pressure is tripled, assuming volume remains constant?

A) 298 K B) 447 K C) 495 K D) 894 K

Ans: D

16. A gas has a pressure of 3.0 atm at 40°C. What is its pressure at 24°C, assuming its volume remains constant?

A) 1.8 atm B) 2.8 atm C) 3.2 atm D) 5.0 atm

Ans: B

17. The temperature of a gas sample confined in a 2002-mL container was raised from 27.0°C to 77.0°C. If the initial pressure of the gas was 1210 mm Hg, what was the final pressure of the gas?

A) 311 mm Hg B) 605 mm Hg C) 1410 mm Hg D) 2410 mm Hg

Ans: C

17. A fixed volume of gas has a temperature of  $5.0^{\circ}\text{C}$  and pressure of  $0.6500\text{ atm}$ . Calculate the temperature after the gas is heated so that its pressure is  $3.200\text{ atm}$ .

Ans:  $1.10 \times 10^3\text{ }^{\circ}\text{C}$

18. A sample of gas has a volume of  $0.500\text{ mL}$  at a temperature of  $301\text{ K}$  and a pressure of  $802\text{ torr}$ . Calculate the temperature, in degrees Celsius and kelvin, that will be required to compress the sample to a volume of  $0.250\text{ L}$  at a pressure of  $902\text{ torr}$ .

Ans:  $169\text{ K}, -104^{\circ}\text{C}$

19. A  $298\text{-mL}$  sample of nitrogen gas is collected at  $30.0^{\circ}\text{C}$  and a pressure of  $595\text{ torr}$ . Calculate the volume of the gas at STP.

Ans:  $210\text{ mL}$

20. A  $0.750\text{-L}$  volume of gas at  $308.0\text{ torr}$  and  $51.00^{\circ}\text{C}$  is heated until the volume of the gas is  $2.000\text{ L}$  at a pressure of  $718\text{ torr}$ . What is the final temperature of the gas?

A)  $300^{\circ}\text{C}$  B)  $369^{\circ}\text{C}$  C)  $1740^{\circ}\text{C}$  D)  $2010^{\circ}\text{C}$

Ans: C

21. A gas under  $33.30\text{ atm}$  pressure occupies  $30.00\text{ L}$  at  $273^{\circ}\text{C}$ . What is the volume of the gas at STP?

A)  $259\text{ L}$  B)  $500\text{ L}$  C)  $1000\text{ L}$  D)  $2000\text{ L}$

Ans: B

22. A sample of gas occupies  $14.30\text{ L}$  at  $19.00^{\circ}\text{C}$  and  $790.0\text{ mm Hg}$ . What is the new volume of the gas at  $190.0^{\circ}\text{C}$  and  $79.00\text{ mm Hg}$ ?

A)  $62.3\text{ L}$  B)  $221\text{ L}$  C)  $227\text{ L}$  D)  $273\text{ L}$

Ans: C

23. Calculate the pressure exerted by  $0.912\text{ mol}$  of hydrogen gas confined to a volume of  $2.84\text{ L}$  at  $30.0^{\circ}\text{C}$ .

Ans:  $7.99\text{ atm}$

24. What are standard conditions, measured in torr and kelvins?

A)  $760\text{ torr}, 273\text{ K}^{\circ}$  B)  $760\text{ torr}, 298\text{ K}^{\circ}$  C)  $760\text{ torr}, 0\text{ K}^{\circ}$  D)  $0\text{ torr}, 0\text{ K}^{\circ}$

Ans: A

25. What is the volume of a 10-L gas sample at 496 K and 2.5 atm when conditions are changed to STP?

- A) 7.0 L B) 11 L C) 14 L D) 21 L

Ans: C

26. What volume does 14.00 g of nitrogen gas occupy at STP?

- A) 5.60 L B) 11.2 L C) 22.4 L D) 33.6 L

Ans: B

27. A gas sample contains 0.1 mol of oxygen and 0.4 mol of nitrogen. If the sample is at STP, then what is the partial pressure due to nitrogen?

- A) 0.2 atm B) 0.5 atm C) 0.8 atm D) 1 atm

Ans: C

28. When 40.0 L of  $N_2$  gas is collected at 22.0°C over water, the pressure is 0.957 atm. What is the volume of dry nitrogen at STP (the partial pressure of water at 22.0°C is 19.8 torr)?

- A) 26.2 L B) 29.5 L C) 30.3 L D) 34.4 L

Ans: D

29. The pressure on 35 mL of a gas increases from 774 torr to 1548 torr at constant temperature. What is the new volume of the gas?

- A. (1548 torr/35 mL)774 torr  
B. 35 mL(1548 torr/774 torr)  
C. (774 torr/35 mL)1548 torr  
D. 35 mL(774 torr/1548 torr)

Ans: D

30. As the pressure of a gas sample is changed from 380 torr to 760 torr at constant temperature, the volume of the gas:

- A. increases  
B. decreases  
C. remains the same  
D. will depend on the flexibility of the container

Ans: B

**END OF SECTION**