



## 12 • The Gas Laws

### PRACTICE TEST

$$\text{STP} = 1 \text{ atm and } 273 \text{ K} \cdot R = 0.0821 \frac{\text{L}\cdot\text{atm}}{\text{mol}\cdot\text{K}} = 8.31 \frac{\text{L}\cdot\text{kPa}}{\text{mol}\cdot\text{K}} \cdot 1 \text{ atm} = 760 \text{ mmHg} = 101.3 \text{ kPa}$$

- A pressure of 745 mmHg corresponds to how many atmospheres?  
a) 0.980                      d) 1.02  
b) 0.566                      e) none of these  
c) 2.00
- A gas at 750 mmHg and with a volume of 2.00 L is allowed to change its volume at constant temperature until the pressure is 600 mmHg. What is the new volume of the gas?  
a) 1.60 L                      d) 2.50 L  
b) 2.00 L                      e) 15.0 L  
c) 27.0 L
- A 150 mL sample of a gas at 80.0 kPa has its pressure changed to 66.6 kPa. What is the new volume of the gas?  
a) 125 mL                      d) 315 mL  
b) 550 mL                      e) 180 mL  
c) 250 mL
- A sample of a gas with a volume of 700 mL and pressure of 1.00 atm is brought to a volume of 200 mL at constant temperature. What is the final pressure of the gas?  
a) 1.00 atm                      d) 0.286 atm  
b) 1.40 atm                      e) none of these  
c) 3.50 atm
- A sample of gas occupies 324 mL at 40.0°C. What volume will the gas occupy at 20.0°C if there is no change in pressure?  
a) 162 mL                      d) 346 mL  
b) 648 mL                      e) 303 mL  
c) 330 mL
- A temperature of 36.0 °C represents twice as much kinetic energy as...  
a) 18 °C   b) 72 °C   c) -119 °C   d) 155 °C
- If the volume of a gas at 323 K is changed from 780 mL to 620 mL at constant pressure, what will the new temperature of the gas be?  
a) 257 K                      d) 303 K  
b) 406 K                      e) 381 K  
c) 321 K
- What would be the pressure of a gas, originally at 101.3 kPa, if the temperature is lowered from 95.0°C to 85.0°C at constant volume?  
a) 735 mmHg                      d) 680 mmHg  
b) 781 mmHg                      e) 739 mmHg  
c) 760 mmHg
- A constant volume of gas at 97.3 kPa and 275 K undergoes a change in pressure to 104 kPa. What is the new temperature of the gas?  
a) 257 K                      d) 294 K  
b) 275 K                      e) 225 K  
c) 325 K
- A gas at 25.0°C and 680 mmHg occupies 345 mL. What is the volume of the gas at STP?  
a) 283 mL                      d) 421 mL  
b) 336 mL                      e) 306 mL  
c) 353 mL

11. A gas in a 400 mL flask exerts a pressure of 0.800 atm at 25°C. What is the temperature of the gas in a 250 mL flask at 1.00 atm?

- a) -124°C                      d) 323°C  
 b) -40°C                        e) 20°C  
 c) 108°C

12. 1.22 L of a gas at 298 K and 750 mmHg undergoes a change in pressure and temperature to 323 K and 710 mmHg. What is the new volume of the gas?

- a) 1.40 L                        d) 1.06 L  
 b) 1.25 L                        e) 0.800 L  
 c) 1.22 L

13. What volume will 27.6 g of SO<sub>2</sub> occupy at a pressure of 97.3 kPa and temperature of 38.0°C?

- a) 0.733 L                        d) 1.40 L  
 b) 0.0151 L                      e) 11.4 L  
 c) 10.5 L

14. A 240 mL sample of gas at 100°C and 755 mmHg is found to have a mass of 1.12 g. What is the molar mass of the gas?

- a) 130 g/mol                      d) 34.2 g/mol  
 b) 38.5 g/mol                      e) 6.72 g/mol  
 c) 144 g/mol

15. According to the kinetic molecular theory, which observation below is NOT correctly explained:

- |    | <u>Observation:</u>  | <u>Explanation:</u>  |
|----|--|--|
| a) | decreased volume of a gas results in increased pressure of a gas | more particles in an area have more collisions with the walls    |
| b) | increased temperature of gas results in increased gas volume     | particles move faster colliding more often and harder with walls |
| c) | increased temperature of gas results in increased gas pressure   | particles move faster colliding more often and harder with walls |
| d) | all three are correct  |  |

**Answers:**

1.		6.		11.	
2.		7.		12.	
3.		8.		13.	
4.		9.		14.	
5.		10.		15.	