

Combined Gas Law

- 1) A weather balloon is inflated to a volume of 12,500 L with helium. When it is released from the ground the air pressure is 1 atmosphere and the air temperature is 17°C. It travels to an altitude of 25,000 ft where the temperature is -35°C and the pressure is 0.4 atm. What is the volume of the balloon at this altitude?
- 2) A gas has a volume of 800.0 mL at -23.00 °C and 300.0 torr. What would the volume of the gas be at 227.0 °C and 600.0 torr of pressure? **800 mL**
- 3) 500.0 liters of a gas are prepared at 700.0 mm Hg and 200.0 °C. The gas is placed into a tank under high pressure. When the tank cools to 20.0 °C, the pressure of the gas is 30.0 atm. What is the volume of the gas?
- 4) What is the final volume of a 400.0 mL gas sample that is subjected to a temperature change from 22.0 °C to 30.0 °C and a pressure change from 760.0 mm Hg to 360.0 mm Hg? **867 mL**
- 5) What is the volume of gas at 2.00 atm and 200.0 K if its original volume was 300.0 L at 0.250 atm and 400.0 K?
- 6) At conditions of 785.0 torr of pressure and 15.0 °C temperature, a gas occupies a volume of 45.5 mL. What will be the volume of the same gas at 745.0 torr and 30.0 °C? **50.4 mL**
- 7) A gas occupies a volume of 34.2 ml at a temperature of 15.0°C and a pressure of 800.0 torr. What will be the volume of the gas at standard conditions?
- 8) The volume of a gas originally at standard temperature and pressure was recorded as 488.8 mL. What volume would the same gas occupy when subjected to a pressure of 100.0 atm and temperature of -245.0 °C? **0.50 mL**
- 9) A gas sample occupies 3.25 liters at 24.5 °C and 1825 mm Hg. Determine the temperature at which the gas will occupy 4250 mL at 1.50 atm.
- 10) 2.00 liters of hydrogen, originally at 25°C and 750.0 mm Hg, are heated until a volume of 20.0 liters and a pressure of 3.50 atmospheres is reached. What is the new temperature? **10,567 K**
- 11) A gas balloon has a volume of 106.0 liters when the temperature is 45.0 °C and the pressure is 740.0 mm of mercury. What will its volume be at 20.0 °C and 780 .0 mm of mercury pressure?
- 12) If the absolute temperature of a given quantity of gas is doubled and the pressure tripled, what happens to the volume of the gas?
- 13) A gas is heated from 263.0 K to 298.0 K and the volume is increased from 24.0 liters to 35.0 liters by moving a large piston within a cylinder. If the original pressure was 1.00 atm, what would the final pressure be?
- 14) A gas is heated from 263.0 K to 298.0 K and the volume is increased from 24.0 liters to 35.0 liters by moving a large piston within a cylinder. If the original pressure was 1.00 atm, what would the final pressure be? **0.78 atm**
- 15) The pressure of a gas is reduced from 1200.0 mm Hg to 850.0 mm Hg as the volume of its container is increased by moving a piston from 85.0 mL to 350.0 mL. What would the final temperature be if the original temperature was 90.0 °C?