

Combined Gas Law Worksheet

Assume that the amount of gas is constant in the following problems.

1. A helium-filled balloon at sea level has a volume of 2.1 L at 0.998 atm and 36°C. If it is released and rises to an elevation at which the pressure is 0.900 atm and the temperature is 28°C, what will be the new volume of the balloon?
2. At 0.00°C and 1.00 atm pressure, a sample of gas occupies 30.0 mL. If the temperature is increased to 30.00°C and the entire gas sample is transferred to a 20.0-mL container, what will be the gas pressure inside the container?
3. A sample of air in a syringe exerts a pressure of 1.02 atm at a temperature of 22.0°C. The syringe is placed in a boiling water bath at 100.0°C. The pressure of the air is increased to 1.23 atm by pushing the plunger in, which reduces the volume to 0.224 mL. What was the original volume of the air?
4. An unopened, cold 2.00 L bottle of soda contains 46.0 mL of gas confined at a pressure of 1.30 atm at a temperature of 5.0°C. If the bottle is dropped into a lake and sinks to a depth at which the pressure is 1.52 atm and the temperature is 2.09°C, what will be the volume of gas in the bottle?
5. A sample of gas of unknown pressure occupies 0.766 L at a temperature of 298 K. The same sample of gas is then tested under known conditions and has a pressure of 32.6 kPa and occupies 0.644 L at 303 K. What was the original pressure of the gas?