

## Gay-Lussac's Law &amp; Combined Gas Law

Gay-Lussac's Law	Combined Gas Law
$\frac{P_1}{T_1} = \frac{P_2}{T_2}$	$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$
V, n constant	n constant

Always Convert  
T to Kelvin!!!

1. A cylinder of gas has a pressure of 4.40 atm at 25°C. At what temperature, in °C, will it reach a pressure of 6.50 atm? [remember to convert to K first then back to °C!]
2. A cylinder of compressed gas has a pressure of 4.882 atm on one day. The next day, it has a pressure of 4.690 atm at a temperature of 8°C. What was the temperature, in °C, on the first day?
3. A mylar balloon is filled with helium gas to a pressure of 107.0 kPa when the temperature is 22°C. If the temperature changes to 45°C, what will be the pressure of the helium in the balloon?
4. A container is filled with argon gas has a pressure of 127.5 kPa at a temperature of 290. K. What is the temperature when the pressure is 3.51 kPa? [You do not need to convert back to °C.]
5. A sample of hydrogen gas has a volume of 65.0 mL at a pressure of 0.992 atm and a temperature of 16°C. What volume will the hydrogen occupy at 0.984 atm and 25°C?

6. A student collects 450. mL of HCl gas at a pressure of 100. kPa and a temperature of 17°C. What is the pressure when the volume of the HCl is 350. mL at 0°C?
  
7. A scientist has a sample of gas that was collected several days earlier. The sample now has a volume of 392 mL at a pressure of 0.987 atm and a temperature of 21°C. What was the original temperature (in °C) of the gas, if the volume was 379 mL and the pressure was 0.992 atm? [remember to convert to K first then back to °C!]
  
8. A piston containing argon gas, originally in a volume of 3.50 L at 650. mmHg and -75°C is heated to 358°C and a pressure of 875 mmHg. What is the *change* in the volume of the piston?
  
9. Which of the three variables that apply to equal amounts of gases are directly proportional? Which are inversely proportional?
  
10. **Thinking Critically** Explain why gases such as the oxygen found in tanks used at hospitals are compressed. Why must care be taken to prevent compressed gases from reaching a high temperature?
  
11. What variable is assumed to be constant when using the combined gas law?