**SCH3U Charles Law Worksheet**

1. Give the temperature-volume law both in words and in the form of an equation.
2. How is the volume of a gas affected by a decrease in temperature?
3. What would be the new volume if the temperature on 450 mL of gas is changed from 45°C to -5°C 379 mL
4. A sample of gas whose volume at 27°C is 0.127 L, is heated at constant pressure until its volume becomes 317 mL. What is the final temperature of the gas in Celsius and kelvin? 749 K and 476$^0$C
5. To make 300 mL of oxygen at 20.0°C and change its volume to 250 mL, what must be done to the sample if its pressure and mass are to be held constant? 244K = -29$^0$C. The temperature must be decreased from 20$^0$C to -29$^0$C
6. To what temperature must an ideal gas at 27°C be cooled to reduce its volume to 1/3? -173$^0$C
7. From the data in the following questions calculate the missing quantity.

   a) V1 = 22.4 L; T1 = 0°C; T2 = 91°C; V2 = ? L

   b) V1 = 125 mL; T1 = ? ; T2 = 25oC; V2 = 100 mL

   c) V1 = ? L; T1 = 400 K; T2 = 175 K; V2 = 6.20 L

   d) V1 = 250 mL; T1 = 298 K; T2 = ? K; V2 = 273 mL
8. A 50 cm$^3$ sample of a gas in a syringe at 15°C is heated to 50°C and the syringe's piston is allowed to move outward against a constant atmospheric pressure. Calculate the new volume of the hot gas.
9. What is the final volume if 3.4 L of nitrogen gas at 400 K is cooled to 200 K and kept at the same pressure?
10. Determine the final volume of 20 L of a gas whose temperature changes from -73°C to 327°C if the pressure remains constant.
11. A partially filled plastic balloon contains 3.4 x 10$^3$ m$^3$ of helium gas at 5°C. The noon day sun heats this gas to 37°C. What is the volume of the balloon if atmospheric pressure remains constant?