NAME: **HONORS CHEMISTRY**

SECTION: Charles’ Law and Guy-Lussac's Law Problems

Standard Temperature and Pressure (STP): 0oC, 1 atm (or equivalent)

K = oC + 273

Remember to follow the general strategy:

List what you know

Set up the problem

Estimate and calculate

1. A gas has a volume of 10.0 m3 at standard temperature. Assuming no pressure change, what volume will the gas occupy if the Kelvin temperature is doubled? If the original Kelvin temperature is halved?
2. Chlorine gas in a balloon occupies 250.0 cm3 at 10.0oC. What will its volume be at 60.0oC?
3. Calculate the final volume when a 75.0 mL sample of hydrogen is cooled from 20.0oC to –10.0oC at constant pressure.
4. A sample of gas has a volume of 100.0 mL at 27.0oC. What is its volume at standard temperature?
5. 300.0 cm3 of nitrogen at 15.0oC is heated at constant pressure to 38.0oC. What is the new volume of the nitrogen?
6. A gas occupies a volume of 560 cm3 at a temperature of 120.oC. To what Celsius temperature must the gas be lowered, if it is to occupy 400.0cm3? Assume a constant pressure.

# Guy-Lussac’s Law

1. A sample of nitrogen at 82oC exerts a pressure of 123.1 kPa. What would be the pressure of the nitrogen at 21.0oC?
2. A cylinder of oxygen exerts a pressure of 1.8 atmospheres at 19.2oC. At what temperature will the pressure become 3.6 atmospheres?
3. A soccer ball contains a confined sample of air. The pressure of the air is 1862 torr at 23.0oC. What will be the pressure in the ball at 38.5oC (a *very* hot afternoon!)?
4. An automobile tire has a pressure of 210.0kPa at 20.0oC. What will be the tire pressure after driving, if the tire temperature rises to 35.0oC?

KEY

1. 20.0m3, 5.00m3

2. 294 cm3

3. 67.3 cm3

4. 91.0 cm3

5. 324 cm3

6. 8.0oC

7. 102 kPa

8. 580 K

9. 1960 torr

10. 220.8 kPa