Gay-Lussac's Law

Purpose: To gather experimental evidence of Gay-Lussac's law.

Materials: 125 ml Erlenmeyer flask   Burner and Ring Stand
             Pressure and temperature sensors, interface, etc.   Large beakers

Procedure: Set up the system as demonstrated in class.

             Open the Pressure-Temperature experiment from the Chemistry with Vernier folder.

             Create a water bath at a temperature of your choice. **DO NOT USE A TEMPERATURE
             OVER 60 C.** *After the flask sits in the water bath for a period of 5 minutes*, use Logger Pro to
             record the temperature and pressure.

             Create a graph of the temperature of the water and the pressure of the gas at each of at least **4
             different temperatures (5 is better)**. Put the dependent variable on the correct axis.

Data: • Do a linear regression (a linear fit on Logger Pro) on the data. Do not force a zero.

             • Save your data and graph.   **THIS IS GRAPH ONE**.

             • Click on the graph and labels and change them so that you have a graph with temperature on
                   the Y axis and pressure on the X. This is **GRAPH TWO**. Again, do a linear regression.

Conclusion

             1. What does graph one tell you about the relationship between temperature and pressure?

             2. On **GRAPH TWO**, what is the value of the Y intercept?   _____

             3. Using GRAPH TWO, as the pressure decreased,   _____
             what was happening to the temperature?

             4. Using Graph TWO what would be the value of the pressure   _____
             when the line crossed the y axis?

             5. Using Graph TWO, what is the value of T when the line   _____
             crosses the y axis?

             6. When the line crosses the y axis, there is 0 pressure. What causes pressure?

             7. Since there is no pressure, is there temperature? (temperature is caused
             by movement of molecules)   _____

             8. What is the significance of the Y intercept on graph two?   _____

             9. What is your value for absolute zero?   _____

             10. What the value of absolute zero in degrees K?   _____