

4. Now slowly push on the plunger on the syringe until it reaches the 18 mL mark. Hold it steady in that position until the pressure reading shown in the Pressure (kPa) window stops dropping. Use the mouse to move the cursor to the text box labeled "Entry #2" and click the left mouse button. Press the backspace key until all the numbers in this box disappear. Type 19.0 on the computer keyboard and press ENTER. This records data point #2.
5. You now need to take four additional readings for four intermediate positions of the plunger. Take these readings at 2 mL intervals. For example, your third data point should correspond to a plunger position of 16 mL, your fourth point should correspond to a plunger position of 14 mL, and so on. *Your last reading is at the 10 mL mark.* (Note: After you press ENTER to record an air volume of 19.0 ml, the computer will automatically display correct volume values without you having to type them in.) Once the plunger is in the appropriate position *and the pressure reading on the computer screen stops dropping*, simply press ENTER on the computer keyboard. Use this procedure for your remaining readings.
6. Click the "Stop Sampling" button in the Keyboard Sampling window. Read and record the final room temperature. Has the room temperature remained constant during the experiment?
7. Click on the " Σ " button in the **P versus 1/V window**. (This causes the computer to display the best linear fit to the data in this window.) Select "Print All Displays" from the "File" menu. A dialog box should open. Change "copies" to the number of people in your lab group. Then click on "OK". This will print the two graphs and the data table shown on the screen. (Each lab partner should have these three pages. The printed copies should have the serial number of your computer printed on them to help you avoid getting your printouts mixed up with those from another computer.) *Be sure to include a sample calculation of the PV product in your laboratory report to verify the accuracy of the computer program.*
8. Transfer your values of P, PV, and 1/V from the data table printed by the computer to the data table in this instruction. For the first line of the data table calculate the values of PV and 1/V to make sure the computer has made no errors.

$$P = \underline{86.9} \text{ kPa} \quad V = \underline{21} \text{ mL}$$

$$PV = \underline{86.9 \times 21} \quad (\text{Substitute}) = \underline{1824.9} \text{ kPa}\cdot\text{mL} \quad (\text{Final Answer})$$

$$1/V = \underline{1/21} \quad (\text{Substitute}) = \underline{0.0476} \text{ 1/mL} \quad (\text{Final Answer})$$

9. In the data table there is a place for the sum of the values of PV and the average. Calculate the sum and the average and enter them on the data table. Then calculate the percent deviation of each value of PV from the average. Show a sample calculation below for the first value of PV and do the other calculations on scratch paper. Enter the percent deviations on the data table.

$$PV_{av} = \frac{\text{Sum of values}}{\text{Number of values}} = \frac{\underline{10932.9}}{6} \quad (\text{Substitute})$$

$$= \underline{1822.15} \text{ kPa}\cdot\text{mL} \quad (\text{Final Answer})$$

$$\% \text{ Dev.} = \frac{PV - PV_{av}}{PV_{av}} \times 100 = \quad (\text{Substitute})$$

$$= \underline{0.15} \% \quad (\text{Final Answer})$$

10. Attach the data table and graphs printed by the computer to the back of this lab report.