

Instructions for Experiment A8

Setting up the Vernier equipment and obtaining measurements

1. Connect the temperature probe to the LabPro interface box through channel 1.
2. Connect the LabPro interface box to the power outlet with the power cord. The LabPro will beep to indicate it is ready.
3. Connect the LabPro interface box to the laptop computer using the USB cable. The USB ports are found in the back of the laptop on the right hand side when the screen is facing you.
4. Connect the computer to the Ethernet using the Ethernet cable and the port located on the lab bench. The Ethernet port for the computer is located in the back of the laptop on the right hand side when the screen is facing you.
5. **IMPROTANT:** Prepare the computer to monitor temperature by opening the file "Hess's Law " from the Chemistry 1A desktop folder.
6. Place a Styrofoam cup into a 250 mL beaker as shown in Figure 1. Measure out 100.0 mL of deionized water into the Styrofoam cup. Lower the Temperature Probe into the solution.

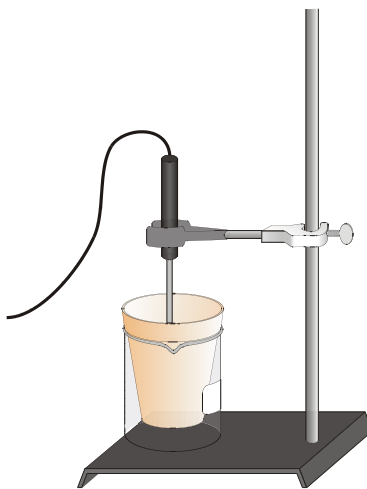


Figure 1

7. Use a utility clamp to suspend a Temperature Probe from a ring stand as shown in Figure 1.
8. Obtain solid sodium hydroxide, NaOH, from your instructor. Weigh out about 2 grams of solid sodium hydroxide and record the mass to the nearest 0.0001 g. NOTE: Since sodium hydroxide readily picks up moisture from the air, it is necessary to weigh it and proceed to the next step without delay. CAUTION:

Handle the NaOH and resulting solution with care. Clean up any spills or dropped pellets immediately!

9. Click on to begin data collection and obtain the initial temperature, t_1 . It may take several seconds for the Temperature Probe to equilibrate at the temperature of the solution. After three or four readings at the same temperature have been obtained, add the solid NaOH to the Styrofoam cup. Using the stirring rod, stir continuously for the remainder of the 200 seconds or until the temperature maximizes. As soon as the temperature has begun to drop after reaching a maximum, you may terminate the trial by clicking .
10. Examine the initial readings in the table to determine the initial temperature, t_1 . To determine the final temperature, t_2 , click the Statistics button, . The maximum temperature is listed in the statistics box on the graph. Record t_1 and t_2 in your data table. There is no need to save the run once you have recorded t_1 and t_2 in your data table. When you click again, select "Erase and Continue" from the dialogue box that appears.
11. Rinse and dry the Temperature Probe, Styrofoam cup, and stirring rod. Dispose of the solution as directed by your instructor.