

## Infrared (IR) Spectroscopy and Boiling-Point Determination

**Reading** Experiment 8 in Pavia (5<sup>th</sup> edition), Parts A, B, and C. Also see Techniques 13 (Part A. Boiling Points and Thermometer Corrections) and 25.

### Prelab

In your notebook, include the usual **Name, Date, Title, and Purpose**, draw a picture of the apparatus used for the boiling-point determination (you will be using the Thiel tube apparatus shown in the lecture demonstration). You will need a table in your notebook to fill in the observed boiling point and to record data from the IR spectrum of your unknown liquid.

### Procedure

You will be assigned an unknown compound – note the code for the unknown in your notebook. Work with a partner to determine the boiling point of the unknown liquid using the apparatus described below. Repeat the measurement two more times and take the average of the three values.

Use the apparatus shown in Figure 13.4 (Pavia) with the high-temperature thermometer (blue). Use a Thiele tube to heat the sample (as shown in the demonstration in lab).

Obtain the IR spectrum using the NaCl thin film method. Refer to the handout **Infrared (IR) Spectroscopy. How to Prepare Samples** found at the class website (in the Laboratory folder under Spectroscopy Reference) for the correct practices on preparing samples and handling the NaCl plates.

### To Complete the Experiment – Template

In your notebook, calculate and report average boiling point, the key peaks observed in the IR spectrum and your conclusion about the identity of the unknown – it is one of the compounds in the table on p. 67 of Pavia. Download the IR and BP template from the class website and fill in with the required information, then print. Include this as the cover page of your report with the copies of the notebook pages, and then the IR spectrum (either the original or a copy).