

Lab 03: Infrared Spectroscopy of Unknown Compounds

Assigned Reading

Read Technique 25, sections 25.1-25.3 which described the technique of preparing samples using silver chloride windows.

Procedure

Part I- Obtaining an IR Spectrum

Obtain an unknown from your instructor and record the number of the unknown in your lab notebook. Measure the IR spectrum of the unknown using the AgCl salt plates as your instructor has directed.

After you have recorded the IR spectrum of your unknown, analyze the spectrum using a correlation table. While you will not be able to identify all peaks, try to identify all of the important and large peaks (such as those representing key functional groups). Make a table listing each important peak (wavenumber) and possible assignment from the correlation tables. You should also record the shape and intensity of the peaks for your spectrum. After analyzing your spectrum, propose a functional group for the compound.

Part II-Empirical Formula and Molecular Formula

Show your spectrum, table, and proposed functional group assignment to you instructor. Your instructor will then give you percent compositions and molar mass for your unknown. Use this information to determine the empirical formula and molecular formulas of your compound. Be sure to neatly show your work in your lab notebook.

Part III- Index of Hydrogen Deficiency, and Structure

Calculate the index of hydrogen deficiency using the molecular formula of the compound.

Part IV-Analysis of the NMR Spectra

Your instructor will provide the NMR spectrum to you when you have completed part I, II, and III so that you can determine the actual structure of the unknown compound.