

The main purpose is to report the results of your experiment and calculations, but the background theory will be necessary to explain and interpret your results. You can organize the information in any (logical) order that you like. Refer to the *Guide to Written Reports* from class for more detail. This is a formal report; the clarity of the presentation, including grammar and spelling, are important to your score as well.

Abstract

[2/2] A short summary of the purpose and results of the lab, including what technique was used, what molecules were studied, and what specific characteristics and values were measured. Error bars and comparison to literature values are absolutely necessary here.

Introduction/Procedure/Discussion

[8/8] An understanding of the Raman effect is key to interpreting the spectra you obtained. In your own words, please detail the motivation, method, materials and relevant theory. Below are the main points that you should explain, either as introductory material or at the end during the discussion of your results.

- What is scattering? What molecular characteristic does it measure?
- What is polarizability?
- Compare IR and Raman
- What are the classical equations to describe scattering? What results do these explain?
- What is depolarization in Raman scattering? What information does it give us?
- Briefly explain the experimental procedure.
- What light source and detector were use for this experiment? Why?
- Do the Stokes or anti-Stokes peaks have higher intensity? Why? What is the relevant equation?
- Cite all references used.

Calculations/Error Analysis

[20/20] Include sample calculations for each type of calculation you do, including the error analysis.

- Assign each peak to a particular vibrational mode, and explain how you did so. Compare the different vibrational mode frequencies (bending vs. stretching, C-H vs. C-D, etc.).
- Calculate the force constants for CCl_4 and compare these to the literature values.
- Based on your spectra, calculate the sample temperature and compare this to the true value.
- Calculate the depolarization ratio for each CCl_4 vibrational mode and compare to the literature values. Explain the meaning of these values.
- Be sure to calculate and report the error associated with each measured value, explain what type of error you are reporting, and use this information when comparing to known values.
- Cite all references used.

Results

[20/20] Present all analyzed data and figures. The data from these spectra should be compiled into tables. Include all of the spectra that you measured, clearly labeled and organized at the end of the report as an appendix. This is a list of the spectra necessary for full credit, but keep in mind that some spectra span several different spectral windows.

- CCl_4 Stokes
- CCl_4 anti-Stokes
- CCl_4 Rayleigh
- CCl_4 High-Resolution
- CCl_4 depolarization
- CHCl_3 Stokes
- CDCl_3 Stokes
- OTHER Molecule - Stokes Spectrum (CH_2Cl_2 , benzene or NCS')