This is your chance to explain the work you did and what you learned. The main purpose of *your* presentation is to report the results of your experiment and calculations. You may also want to use some of the background theory to explain your results. Then, we will expand on some of the more interesting results and discussion questions. (I only expect 10-15 minutes from you *at most* before we get into further discussion.) You should prepare to the best of your ability, using this rubric to guide you, but most people learn a lot *during* their report as well!

Introduction

[2/2] Please start by giving a short summary of the purpose and results of the lab in your own words. It is important to include what technique was used and why, what molecules were studied, and what specific characteristics and values were measured.

Results

[20/20] Bring all of the spectra that you measured, clearly labeled and organized. 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^-)

Analysis

[20/20] Most of your work in this lab will be in analyzing your results and comparing them to the known values or values reported in the literature. Please bring 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.
- Keep a record of what references you use, and mention these as you report values and background information.

Background Theory

[8/8] An understanding of the Raman effect is key to interpreting the spectra you obtained. Below are some of the questions that you should think about and try to understand. You will want to explain some of these points when discussing your results, and I may ask you about some of these at the end. Remember that there is often more than one answer to a particular question.

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