

This is your chance to explain the work you did and what you have learned. The main purpose of *your* presentation is to report the results of our experiment and calculations. You may 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 minute 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.

1 Introduction

[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.

2 Calculations and Results

[30] The majority of the work in this lab is calculating the magnetic properties of your solutions based on your measurements and comparing these to theoretical values. Please bring sample calculations for each type of calculation you do, including error analysis. Calculations include:

- The apparatus constant using several different approaches.
- The maximum magnetic field strength.
- The magnetic susceptibility in several different forms (molar, mass, etc.)
- The effective magnetic moment.
- Predicted number of unpaired electrons in strong and weak fields.
- Total spin angular momentum, total orbital angular momentum and total angular momentum.
- Comparison to the literature values for experimentally determined quantities.
- Error analysis must be included.

You should also bring tabulated results of the calculations for all of the solutions. If you did Part II, also bring the required plots.

3 Background Theory

[18] Interpreting your data requires an understanding of the theory of magnetism. In your own words, please detail the motivation, method, materials and relevant theory.

- What is paramagnetism? Diamagnetism?
- How is magnetic susceptibility related to magnetic moment?
- How is the number of unpaired electrons related to the magnetic susceptibility?
- How do different ligand fields affect the magnetic susceptibility?
- What is the physics behind the Gouy balance technique?
- Discussion questions 1-3 from the end of the handout.

Note: This is not meant to be a complete list of the ideas you should understand, but rather a guide. Refer to the lab handout for other concepts. Also, refer to the Guide to Oral Reports for a good general guide.