

Viscometer Lab Correction Notes January 25, 2014

A goal for the reports is to make them as short as possible while conveying the main points necessary to describe the experiment. This means that if you can show a table as a graph you must do that. Also, if you can combine two graphs you need to do that. Also, you should show an example graph of typical data then just the results of your analysis, the distilled numbers with error bars. Do not report a number without a confidence level indicate by an error range. Never show raw data except under extremely unusual conditions. Explain what you did to reduce the data to the final form that is presented.

Before you turn in your lab take a close look at the quiz and the notes in your notebook and make sure that you have included all of the important things you can garner from these two sources. If you have a sketch of a cone and plate viscometer in your notes and haven't mentioned a cone and plate viscometer in the report then you should realize that something is missing from the report.

1) Abstract should have three paragraphs:

- 1) Viscosity of polymers is important because...
- 2) What you did
- 3) It was demonstrated... This is important because...

2) Introduction: The Arrhenius Function, WLF, Vogel-Fulcher and several other equations are related as a family of corrections to simple thermally activated processes. If you use Arrhenius in the questions or quiz and the WLF in the analysis, logically you should mention this relationship. This discussion is central to understanding the temperature dependence of viscosity in polymers.

Introduction has to have three parts:

- 1) Why is this topic important in general
- 2) Specifically what is important here and why, what equations to you need, where do they come from how are they derived
- 3) Why is this topic important, what is the impact etc.

3) Experimental, don't give too much detail. Just what viscometer, cone and plate and the samples and conditions.

4) Results/Discussion

If you report a number it needs an error. If you calculate viscosity and error in viscosity you need to use that error to get significant figures in your viscosity!!!!

Don't show raw data unless you want to talk about specific values. **Generally, don't show raw data at all. You don't need to include an appendix unless it has some value to the report. Generally don't include appendices. I don't need to see raw data. You can give an example (a plot with error bars) of the kind of raw data or an example of, say, where modulus comes from (using a plot with error bars), but all of the numbers are distracting from the point and open you up to issues such as reporting too many significant figures etc. You can keep a record of the raw data in your notebook if it makes you feel more**

comfortable and if you want a complete record of what occurred... (It is not necessary for me.)

5) Error Section: The purpose of this section is to justify the accuracy you claim in your results section. Everything you put into this section should server this purpose. Nothing else should be included in this section.

If your error is ± 80 cp and your value is 500 cp the answer is 500 ± 80 cp. If you report 460.2333333 ± 80.22869 you will be laughed out of the room at any job. If you can't see this please talk with me.

6) Conclusion should have three paragraphs at least:

- 1) Viscosity of polymers is important because...
- 2) What you Found
- 3) Why was it important (refer to part 1)...

5) Significant digits. Any time you write a number down you need to consider how many significant digits. e.g. $R^2 = 0.9999992341$ is foolish to put in a report.