

TECHNICAL REPORT GRADE SHEET

1/2

Experiment: <u>Viscometry and Rheology</u>	Project # _____
Date: _____	Section # _____
Report Grade: _____	Group # _____
E1: _____	E2: _____
	E3: _____

Criteria	Description	Points Possible	Points Received
Cover Memo or Abstract	Complete. State objectives. Gives precise “big picture” statement of most important results and conclusions. State methods as needed.	10	
Intro. & Objectives	Interesting, relevant. Objectives clear, concise, quantitative, specific to project.	10	
Literature Review	Three research articles. Relevant. Concise but informative summary.	10	
Apparatus and Procedure	Good schematic and discussion thereof. Relates measurements to data needed to meet objectives. No 2 nd person. Not written to operator or technician. Does not assume Instructor has prior knowledge.	10	
Principles/ Equations	Complete and correct. Relates to objectives. Shows physical meaning. Relates to experiments. Equations numbered. Standard symbols used. Sufficient references. Does not assume instructor’s prior knowledge.	10	
Experimental Plan	Concise but clear description of the conditions, levels, exact runs performed. Total number of runs.	5	
Results and Discussion	Logical and orderly. Relates to project objectives. Each figure and table called out & discussed thoroughly. Good topic sentences followed by strong paragraphs. Each observation and conclusion supported. Thorough. Does not assume Instructor has prior knowledge. Critical Thinking!	20	
Conclusions	Supported by Results and Discussion. Consistent w/ Objectives. Repeat quantitative, specific findings. Relevant and useful. Critical Thinking	5	
Literature Cited	Cite all relevant journal articles, books, handbooks, etc. wherever needed in the main body. Use standard (ACS Guide) methods to call out citations. Provide complete bibliographic info. In the Lit. Cited section. No footnotes. Minimize direct quotes. No titles cited in the text.	5	
Appendix I	Copies of Laboratory Notebook pages.	5	
Appendix II	Copy of Sample Calculations.	5	
Appendix III	Copy of three articles cited in Lit Review.	5	
Lab Notebook Appendix	Submit raw data; copy pages from notebook	5	
Documentation Appendix	Document sample calculations; provide sufficient narrative, working equations, units, etc. so that TA can follow the calculations.	5	
Appearance	All required sections. Margins observed. Neat handwriting if necessary. Stapled or clipped. Neat. Conform to Lab Manual instructions	5	

Figures	Corrected Excel or PowerPoint defaults. Margins. Large enough to read. No excessive frames or borders. Discuss every figure. Capitalize "Figure x"	5	
Tables	Informative titles and headings. Describe content of tables (columns & rows). Only 3-4 significant digits. Show units. Useful information. Corrected Excel or PowerPoint defaults. Margins. Large enough to read. No excessive frames or borders. Discuss every table. Capitalize "Table y"	5	
Grammar and Spelling	Check verb use with "data." Complete sentences. Homonyms. Apostrophes. Minimal use of possessives. No 2 nd person. Noun / verb agreement.	5	
Digital Report	CD Included with the final report (in a single word document) and all files used to calculate the results recorded.	10	
Required Content			
1	Calculate the shear rate corresponding to each rotational speed. Then, using the percent torque obtained at each rotation speed, calculate the shear stress (τ) and the viscosity as a function of shear rate. Compare the calculated viscosity values with those read directly off the digital display of the Brookfield instrument. Remember that the calculated values and the corresponding values read from the digital display should match, otherwise check your calculations for possible errors.	23.3	
2	Manipulate the Ellis model into a $\gamma = f(\tau)$ model using $\eta = \tau/\dot{\gamma}$; do the same for the power law model.	23.3	
3	Fit the shear stress-shear rate data and viscosity-shear rate data taken at 25°C for the (a) 50/50 weight% glycerol-water mixture, and (b) CMC (or polyacrylamide) solution in 50/50 wt% glycerol-water mixture to the Newtonian, power law, and Ellis models given below. Select the model that best fits the data and briefly explain your choice. Also, explain clearly why the other models do not fit the data well.	23.3	
4	Model the 50/50 wt% glycerol-water mixture data taken at different temperatures with the Arrhenius-type temperature-dependent model. Estimate the parameters A and B. The above viscosity-temperature relationship is called Andrade equation [4], or Andrade-Eyring equation.	23.3	
5	Plot the viscosity of the glycerol-water solutions obtained at different weight %'s vs weight % glycerol and compare with literature data.	23.3	
6	Model the viscosity of the glycerol-water solutions as described in the hand out, including the temperature dependence (use literature data is needed).	23.3	
	Total	280	
	Percentage of Total		