CHEM 133 WRITING ASSIGNMENT #3
CHROMATOGRAPHY AND MOLECULAR MODELING
RESULTS AND CONCLUSIONS

The purpose of writing assignments is to teach you how to communicate the *results and conclusions* of experiments using clear, concise, and well-organized language. To that end, specific prompts are given below. Your task is to write a coherent response to the prompts.

1. In an introductory paragraph(s), clearly and concisely describe the specific purpose(s) of this experiment. Be sure to address the "lab" and "modeling" components of the experiment. In your introduction, be sure to mention not only all of the amino acids that were studied in this experiment, but also the various physical/chemical properties that were modeled.

2. Summarize the *experimental data* (i.e. results) you collected in this experiment. This should include all measured distances on your paper chromatography and calculated Rf values. Place these results in a NEAT table. In a separate NEAT table, summarize the results of the modeling experiment. Your table should look *somewhat* like the table on page 61a, although it does not have to look exactly like that.[1]

3. Very clearly explain how the results collected in your experiment were analyzed in order to draw conclusions about your unknown amino acid. It is NOT appropriate to conclude with "My unknown contained glycine and valine." Instead, you must describe HOW YOU KNOW your compound contained glycine and valine. In other words, explain how you interpreted the data from your experiment to identify the compound(s) in your sample. This means clearly identifying and explaining the Rf value trends vs. the various properties determined by the modeling experiment. Your goal is to convince the reader of the logic behind your compounds' identification. The reader (instructor) will not assume anything for himself or herself, so it is your job to clearly explain your reasoning.

The writing assignment will NOT be graded on whether you have correctly identified the compounds in your unknown. Your report sheet is used for that purpose. Instead, your written assignment will be graded for the clarity and completeness of your report. Grammar/spelling/sentence and paragraph structure will also be considered, but we are primarily looking for the overall quality of your written explanation.

This assignment must be typed. It must be double-spaced with one-inch margins, using Times New Roman 11-font. A good results and conclusions section for this experiment will likely be 1-2 pages. Be sure to use spelling and grammar check, but do not completely rely on the checker because it will miss many things (e.g. to/too/two). Do not use any person pronouns (I, we, you, they, etc.) in writing your results and discussion.

All writing assignments must be submitted through TurnItIn. See handout provided by instructor.

[1] If you are uncomfortable with creating tables in Excel or Word, please ask your instructor for assistance.

Name _____
Drawer No. _____ Lab Day _____

CHROMATOGRAPHY
Report Sheet

Data:

1. On the paper chromatograph, circle all spots observed and mark the solvent front. Note that there may be more than one spot for the unknown.

2. Draw a sketch of the completed paper chromatograph in your lab notebook.

Calculations/Results:

1. On the paper chromatograph, label the solvent front, measure and mark the distance (in cm) from the origin to the solvent front and from the origin to the center of each spot.

   Attach your paper chromatograph to the back of this report sheet.

2. Fill in the distances in cm and calculate the R_f values:

Amino Acid	Solvent Front (cm) Trial 1	Solvent Front (cm) Trial 2	Spots (cm) Trial 1	Spots (cm) Trial 2	R_f Values Trial 1	R_f Values Trial 2
D	3.9cm	3.9	1.0	1.1	0.25	0.28
G	3.9	3.9	1.4	1.5	0.35	0.38
L	3.9	3.9	3.0	3.2	0.76	0.82
V	4.0	4.0	2.3	2.5	0.57	0.62
Unk	4.0	4.0	1.4	1.5	0.35	0.37
	4.0	4.0	3.0	3.1	0.75	0.77

   Show sample calculations of R_f values on the back of this report sheet.

3. Identify the amino acid(s) in the unknown by comparing the R_f value(s) to those of the known amino acids.

   Unknown No. 2 Amino Acid(s) present: glycine, Leucine

CHROMATOGRAPHY MODELING Report Sheet

Fill in the calculated information for each of the five amino acids: Your instructor will assign you one extra amino acid to calculate from the list at the bottom of this page.

AA	Energy(au)	Energy(HOMO) (eV)	Energy(LUMO) (eV)	Dipole Moment (debye)	Molecular Weight	Area(Å^2)	Vol(Å^3)	R_f T_1 T_2
D	-509.49	-10.86	4.86	3.51	133.103	144.02	116.88	0.29, 0.28
G	-282.82	-10.88	5.12	2.74	75.067	97.01	71.47	0.39, 0.38
L	-438.963	-10.59	5.12	1.73	131.175	171.48	143.99	0.76, 0.82
V	-399.931	-10.61	5.06	1.67	117.148	152.98	125.94	0.57, 0.62
M	-797.438	-9.03	4.58	3.36	149.214	177.53	145.77	**Predict**

PREDICT the approximate R_f value for your assigned amino acid. In order to do this, you will need to compare the R_f values that you measured on your paper chromatograph with the data you calculated in the table above. You must draw conclusions about what property (or properties) is/are directly/indirectly related to R_f value *based on your chromatography and modeling experimental results.*

Predicted value of R_f for amino acid _____ = _____

In one or two complete sentences, clearly explain how you made your prediction. Use the back of this sheet if necessary.

Possible amino acids:

Alanine – A
Methionine – M

Cysteine – C
Serine – S

Glutamic acid – E
Threonine – T

Isoleucine – I