Chemistry 235 Experiment 3 – Report Sheet

Name:	Lab Room:	Desk #:
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Pre-Lab Questions (Complete Prior to Lab)

- 1. It is necessary that you add boiling stones to the distillation flask? Explain why.
- 2. Boiling points in the labs at WVU tend to be slightly lower than expected. Why do you think this is?
- 3. Use the interactive nomograph (link is in the experiment and on course website) to determine the following:
 - a) Boiling Point of dimethylsulfoxide (bp 189 °C at 760 mmHg) at 0.4 mmHg.
 - b) Reduced pressure necessary to lower the bp of HMPA (bp 233 °C at 760 mmHg) to 100 °C.
- 4. Look up the physical data for each of the following compounds and determine whether *crystallization* or *distillation* would be better suited for purification. All compounds can be found at <u>www.sigmaaldrich.com</u>.
 a) Toluene:
 - b) Acetonitrile:
 - c) Anthracene:
- 5. Consider each pair of compounds listed below and determine whether a *fractional distillation* would be necessary to separate them or if a *simple distillation* would be sufficient. You can look up the boiling points at <u>www.sigmaaldrich.com</u>.
 - a) Ethyl acetate and hexane
 - b) Diethyl Ether and 1-butanol
 - c) Bromobenzene and 1,2-dibromobenzene

Experimental Data (Complete During Lab)

Macroscale Recrystallization:

Distillation Type (simple/fractional)	
Unknown	

Distillation Temperature vs Volume

Volume	Temp (°C)						
1 mL		9 mL		17 mL		25 mL	
2 mL		10 mL		18 mL		26 mL	
3 mL		11 mL		19 mL		27 mL	
4 mL		12 mL		20 mL		28 mL	
5 mL		13 mL		21 mL		29 mL	
6 mL		14 mL		22 mL		30 mL	
7 mL		15 mL		23 mL		31 mL	
8 mL		16 mL		24 mL		32 mL	

*Do not distill to dryness. If you only started with 30 mL of unknown, you should stop collecting at ~25 mL.

Post-Lab Questions (Complete Following Lab)

- 1. Plot a graph that has the volume of distillate of the x-axis and distillation temperature on the y-axis. You can do this using the graph on the next page or with excel.
 - a) What is the temperature range at which your distillation took place?
 - b) Based on your curve, how many components are present in your unknown mixture?
 - c) What is the boiling range for each component?
 - d) Based on your data, what compounds are present in your unknown?
- 2. Compare and contrast the observed differences between the simple distillation and the fractional distillation.
