

Lab Report (Due: Thursday, February 3 at 6:00 p.m.)

Please **staple** all these different parts together, **in the order shown**. Please **label** the different sections clearly. As usual, you may photocopy these pages directly from your lab notebook.

Prelab exercise: Prior to lab, write the **title, purpose and materials and methods** section of the lab. **We will be skipping parts C and E.**

Prelab calculation: Complete the Pre-Lab Calculation for caffeine on page 72.

Data section: Prior to lab, lay out some data tables to fill in during lab. For instance, for Part A, the data table may be as simple as:

Data table for Part A	
Mass of caffeine before extraction (g)	
Mass of caffeine after extraction (g)	
Mass of caffeine theoretically recoverable from extraction (g)	
Percent recovery	

Discussion section: (Note: these questions are the same ones that are on page 79 of PLKE — they are enhanced for your understanding pleasure.)

PART A

1. Show your calculations for the amount of caffeine which should be extracted by the three 2.0 mL portions of methylene chloride (see Pre-lab Calculation on page 72 of the experiment and sample calculations in Technique 7, Section 7.2). Note: Use 0.070 g instead of 0.075 g.
2. Report the amount of caffeine isolated. Compare this weight with amount of caffeine calculated in the Pre-lab Calculation. Should they be the same, assuming no experimental loss or error? If they are different, give some possible explanations (be specific).

PART B

1. Report in table form the distribution coefficients for the three solids: benzoic acid, succinic acid, and sodium benzoate. Include all the class data and determine the average for each substance.
2. Is there a correlation between the values of the distribution coefficients and the polarities of the three compounds? Explain. Your explanation must include a reference to the structures of the compounds.
3. Skip question 3.

We're skipping part C, remember?

PART D

1. Report the mp and weight of the neutral compound you isolated.
2. Based on the melting point, what is the identity of this compound?
3. Calculate the % recovery and give three sources of loss.
4. (This is a new question) Answer the following questions about the 1st and 2nd NaOH extracts.
 - a. Compare the amount of precipitate for each when HCl is added.
 - b. What is the precipitate formed when HCl is added?
 - c. Does the amount of precipitate in each tube indicate that all the acid impurity has been removed from the ether layer containing the unknown neutral compound?

We're skipping part E, remember?

QUESTIONS

Technique 7 (pp. 616, 617): 1, 8

[For #8, the question is asking you to explain exactly what you would do when performing the lab instructions given in (a) and (b). A drawing or two might illustrate your point nicely]

Conclusion section: Comment on the efficacy of extraction as a purification method (so basically you're commenting on your technique in part D).