George Pappas
CHM. 121.004
Inst. Mark Novak
Lab Report – Experiment 2
9/21/17

93

Experiment Objective

The objective of this experiment is to mix unknown solids with water and use the methods of vacuum filtration and evaporation to recover each solid. At the end of the experiment, we should have calculated the percent recovery for each of the unknown solids.

Conclusion

Evaporation of Soluble Unknown:

Our unknown letter is C and because it fully dissolved in water we had to use the procedure of evaporation. After correctly following the procedure, we ended up with a 117.30% recovery which is not what I was expecting. I will address why I think we got more than 100% recovery later in the conclusion.

Vacuum Filtration of Insoluble Unknown:

Our unknown letter is D and because it did not dissolve we had to use the procedure of vacuum filtration. After correctly following the procedure, we ended up getting 105.71% for our percent recovery; just like the first, I did not expect to get an over 100% recovery.

For both unknowns, I did not expect the percent recovery to exceed 100%; in fact, I expected to have lost some of the solid during the procedure (which I believe we did).

That being said, just because we got over 100% for our recovery percentage does not mean we got all of our unknown solid back. I know for a fact we didn't because during our vacuum filtration procedure some of the solid was left on the edges of the buchner funnel, some on the plastic scrapper used to take out the filter paper and scrape the left-over residue from the edges, and maybe even some that the filter paper didn't catch and that landed into the flask underneath.

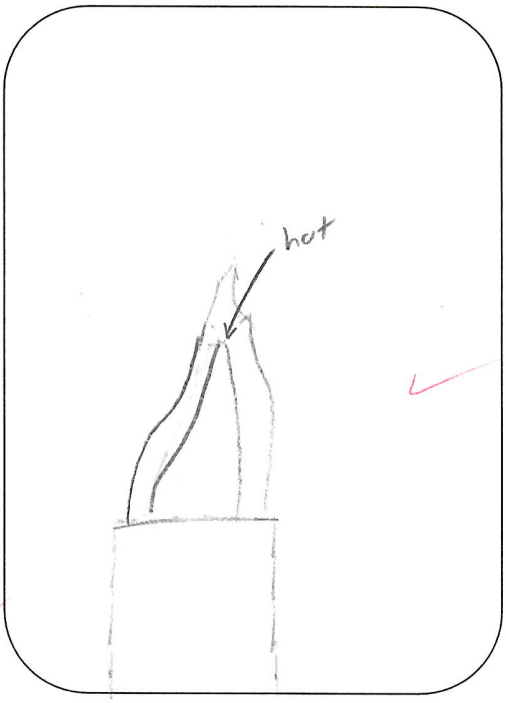
As for why it is over 100%, I am suspecting it could be because of a weighing error; maybe not giving the scale the proper amount of time to balance out or maybe giving it too much time to balance out. However, we did tare the scales before using them. Another possibility could be that some of the solvent may have been absorbed into the solid, this I feel is unlikely because we let the solids dry and evaporate for a week. The last possibility I can think of is a calculation error; however, if there is a calculation error, I cannot find where it is I made my mistake.

Good write-up

 Name George Pappas

Advance Study Assignment

1. In the space to the right, diagram a properly adjusted flame, including both the inner and outer cones.



Label which cone is the hot area and which cone is the relatively cooler area.
at the top and on the outside of the inner blue cone is where it's the hottest

2. What gas(es) is(are) present in the inner cone?

2) all methane

3. Which is the hottest, a yellow/orange flame, a blue flame with no inner cone, or a blue flame with an inner cone?

3) blue flame with an inner cone

4. What is the liquid called that has already passed through a filter?

4) filtrate

5. What should the liquid that has already passed through the filter look like from a successful filtration?

5) Clear with no solids

6. What is a good method to separate an insoluble solid from a liquid?

6) Vacuum filtration

7. What is a good method to separate a soluble solid from a liquid?

7) Evaporation

 Name George Pappas

8. What is one unwanted change that can occur to a solid dissolved in water when it is heated to dryness, in this experiment?

8) the substance might oxidize or burn. If this happens, the chemical generally turns a brown-black color ✓

9. What is another unwanted change that can occur to a solid dissolved in water when it is heated to dryness, in this experiment?

9) If the substance has waters of hydration, such as $CoCl_2 \cdot 6H_2O$, the waters of hydration may be heated off. ✓

10) A solid, whose original weight was 8.492 grams, was dissolved in water. The water solution was evaporated down to a small volume, then allowed to sit in a lab drawer for a week. The resulting weight of the recovered solid was 9.045 grams.

$$\frac{(9.045 \cdot 100)}{8.492} = 106.51\%$$

a) Calculate the percent recovery of the solid. 106.51 % ✓

b) Give at least one reason why the percent recovery was greater than 100.0 %.

the solvent may have been absorbed into the solid. ✓

The solution was not pure to begin with and may have been contaminates

CHM121 E2
Separation / Basic Skills
DATA TABLES

Name George Pappas

1)	Unknown Letter	C
	Person responsible for this unknown	Savanna
	Balance Used **(What number?)**	17
2)	Mass of beaker and solid	217.044g
3)	Mass of dry beaker	216.123 g
4)	Mass of solid (original solid weight) [(#2) – (#3)]	.821g
	Did the solid dissolve? (Yes) or No	
	If 'Yes', complete #5 - #8. Ignore #9 – 12.	
	If 'No', complete #9 - #12. Ignore #5 - 8	
5)	Mass of final dried solid, ~~boiling chips~~ Stir bar (if used), and beaker **after one week**	222.056
6)	Mass of ~~boiling chips~~ Stir bar (if used)	4.970 g
7)	Mass of recovered solid [(#5) – (#6) – (#3)]	.963 g
8)	Percent recovery [(#7)*(100.000%)]/[(#4)]	117.30 %

High -5

9)	Mass of watch glass, filter paper, and solid **after one week**	
10)	Mass of watch glass and filter paper	
11)	Mass of recovered solid [(#9) – (#10)]	
12)	Percent recovery [(#11)*(100.000%)]/[(#4)]	

CHM121 E2
Separation / Basic Skills
DATA TABLES

Name George Pappas

1)	Unknown Letter	D
	Person responsible for this unknown	George Pappas
	Balance Used **(What number?)**	24
2)	Mass of beaker and solid	199.930 g
3)	Mass of dry beaker	197.670 g
4)	Mass of solid (original solid weight) [(#2) – (#3)]	2.26 g
	Did the solid dissolve? Yes or (No)	
	If 'Yes', complete #5 - #8. Ignore #9 – 12.	
	If 'No', complete #9 - #12. Ignore #5 - 8	
5)	Mass of final dried solid, ~~boiling chips~~ Stir bar (if used), and beaker **after one week**	
6)	Mass of ~~boiling chips~~ Stir bar (if used)	
7)	Mass of recovered solid [(#5) – (#6) – (#3)]	
8)	Percent recovery [(#7)*(100.000%)]/[(#4)]	

9)	Mass of watch glass, filter paper, and solid **after one week**	49.674 g
10)	Mass of watch glass and filter paper	47.285 g
11)	Mass of recovered solid [(#9) – (#10)]	2.389 g
12)	Percent recovery [(#11)*(100.000%)]/[(#4)]	105.71%

high
-2