Report for Laboratory Exercise #6
Extraction of Caffeine from Tea [1]

Using Microsoft Word, students are to insert responses in all yellow highlighted areas. It is recommended that the report be completed without changing font size, column width, row width, margins and highlights. The completed report must be uploaded to the 101 CourseSpaces as a .pdf file within 2 calendar days of the end of the scheduled lab period.

Name: Paige Janzen **Lab Section:** B09 **Quad:** 2 **Date:** 22/11/2017

Abstract

(max 3 lines)

A sample of caffeine from a Red Rose[2] Tea bag was determined to be 0.0822 g by liquid-liquid extraction into isopropanol, precipitated with ethanol, and then isolated using vacuum filtration. The weight % of crude caffeine in the tea was found to be 2.77%.

Data/Results Table 1. Experimental data and calculated values

Extraction and isolation	
Weight of tea leaves	2.9657 g
Weight of caffeine	0.0822 g
Weight % caffeine in tea	2.77 %
Lethal dose for a 700 g rat	1.64 cups of tea

Algebraic Equation
Weight % of caffeine in tea =
(weight of caffeine (g) / weight of Red Rose tea leaves (g)) * 100 %

Discussion *Respond to the following:*
How could this experiment be changed to give a more accurate amount of caffeine in a teabag? (max 3 lines).
The caffeine could have been purified through the process of sublimation, or the layers could have formed in a container with a smaller radius for easier extraction from thicker looking layers, or caffeine could have been steeped from finely ground tea leaves.
How does the amount of caffeine measured in tea bag compare with the amounts that might be lethal for a human? (max 3 lines).
The weight of caffeine in a Red Rose tea bag was found to be 0.0822 g, and the LD_{50} is estimated at 150-200 mg/kg for a human[3]. Thus, it is potentially lethal for a human to ingest about 149 tea bags.
Conclusions

(max 1 line)

The weight % of caffeine in a bag of tea was found to be 2.77% for Red Rose Tea.

References

1. Properties of Materials, *Laboratory Manual, Chemistry 101*, pp. 41-46. (University of Victoria: Victoria, B.C.). **Fall 2017.**

2. Red Rose Orange Pokoe Tea. Unilever Canada, Toronto, Ontario, M4W 3R2, 18745.

3. Peters, JM. "Factors Affecting Caffeine Toxicity: A Review of the Literature," *The Journal of New Drugs.* **1967**, 131-141.

Marks	max
Pre-lab quiz	3
Laboratory Notebook: Have all the relevant observations and data been recorded?	1
Abstract: Is the abstract consistent with content of the Exercise?	2
Data/Results: Is the table completed according to the lab notebook with correct numbers of significant figures?	1
Algebraic equation: Is the algebraic equation specific and correct?	1
Discussion: Have the questions been adequately addressed?	1
Conclusions: Are the conclusions consistent with the tabulated data?	1
References: Are the references complete and appropriate?	1
Performance Evaluation: Was the caffeine successfully extracted?	1
Total mark	12