Caffeine Extraction Lab Notes

Fundamentals of Chemistry I (University of Victoria)

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: Lab Section: Quad: _1_ **Date:** _Nov/29/17_

Abstract

(max 3 lines)

Through the means of a liquid liquid extraction process it was demonstrated that a single tea bag of Tetley Orange Pekoe tea contains 6.619% of caffeine. This percentage of caffeine was determined using the equation % Caffeine = weight of caffeine(g) * 100% / weight of tea leaves (g)

Data/Results

Table 1. Experimental data and calculated values

Extraction and isolation	
Weight of tea leaves	3.2634g
Weight of caffeine	0.2160g
Weight % caffeine in tea	6.619%
Lethal dose for a 700 g rat	0.622g, approx. 3 cups of tea.

Algebraic Equation

Weight % of caffeine in tea = [Weight of Caffeine(g) / Weight of 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). Using sublimination instead of a liquid liquid extraction process would yield a more accurate amount of caffeine in a tea bag as the impurities present in liqiuid liquid extraction would have a different sublimination temperature.

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 lethal amount of caffeine for a human is approximately 150-200mg per kg of body mass, therefore the 216mg of caffeine rendered from one tea bag is less than 1% of the average 70kg person.

Conclusions

(max 1 line)

The quantity of caffeine found via liquid liquid extraction in one tea bag of Tetley Orange Pekoe tea is 0.216g.

References

1. Properties of Materials, Laboratory Manual, Chemistry 101,pp.31-39. (University of Victoria: Victoria, B.C.). Fall 2017.
2. Tetley Orange Pekoe. Beverages Canada Inc, Etibicoke, Ontario, M9W 6L2, Lot #CTN304LR

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