**CHEM101 Report for Laboratory Exercise #4**

**Spectrophotometric Determination of Salicylic acid\_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 CHEM 101 Brightspace site as a .pdf file by the due date posted on Brightspace. All answers must be the student’s own work without assistance from others. Only reports which are completed using the template will be marked.*

**Name:** \_\_\_\_Arfaz Hossain\_\_\_\_ **Lab Section:** \_B12\_**Quad:** \_2\_ **Date:** \_June 13, 2024\_

**Abstract**

The % mass of salicylic acid in an acne cleanser\_2\_ , was determined to be \_\_ by measurement of the maximum absorbance at \_\_\_ nm generated a calibration curve. This was found to be \_\_ of the advertised value.

**Data/Results**

*The observed data inserted in the tables below must be consistent with the observed data written in your laboratory notebook with the correct units.*

**Table 1.** Experimentally measured absorbances (A) and calculated concentrations (conc) for the standard salicylic acid solutions.

|  |  |  |
| --- | --- | --- |
|  | Conc (M) |  |
| Stock salicylic solution | 0.002855M |
|  | Conc (M) | Absorbance at \_\_\_ nm |
| Standard Solution #1 |  | 0.152 |
| Standard Solution #2 |  | 0.737 |
| Standard Solution #3 |  | 1.363 |

**Table 2.** Determination of the amount of salicylic acid in the acne cleanser\_\_.

|  |  |  |  |
| --- | --- | --- | --- |
| Volume of acne cleanser used in the analysis (mL) | |  | |
| Density of the acne cleanser used in the analysis (g/cm3) | |  | |
| Advertised %mass of salicylic acid | |  | |
|  | Aliquot #1 | Aliquot #2 | Aliquot #3 |
| Maximum absorbance at \_\_\_ nm |  |  |  |
| [salicylic acid] from the curve (M) |  |  |  |
| Moles of salicylic acid in 25.00 mL (mol) |  |  |  |
| Mass of salicylic acid in 25.00 mL (g) |  |  |  |
| Mass of salicylic acid in 1.00 mL of acne cleanser (g) |  |  |  |
| %mass of salicylic acid in acne cleanser |  |  |  |
| Average % mass of salicylic acid in acne cleanser |  | | |
| Standard deviation of average % mass |  | | |
| % RSD |  | | |
| % comparison to the advertised value |  | | |

**Calibration curve for standard solution of salicylic acid and determination of the salicylic acid concentration in an acne cleanser by interpolation.**

*(cut and paste from Excel)**Figure here.*

**Figure 1.**\_\_

*For figure caption and formatting see pages 10-12 of the CHEM 101 lab manual.*

**Algebraic Equations**

*See page 12 of the CHEM 101 lab manual*

Concentration of a standard solution

\_\_ =

Moles of salicylic acid in 25.00mL solution

\_\_ =

Mass of salicylic acid in 25.00 mL solution

\_\_ =

Mass of salicylic acid in 1.00 mL of acne cleanser

\_\_ =

%mass of salicylic acid in acne cleanser

\_\_=

**Discussion** *Respond to the following:*

*Explain how the calibration curve was generated and then used to provide a value for the concentration of the salicylic acid solution that was placed in the spectrophotometer (max 5 lines).*

\_\_

*Explain why the iron solution was transferred to the volumetric flasks using a graduated cylinder, while the salicylic acid was transferred using volumetric pipettes (max 3 lines).*

\_\_

*Was the % comparison greater than or less than 100%? Include the actual value in your answer. Give a scientific explanation as to why the value was less than or greater than 100%. Do not give personal (lost some of the solution, hard to see the calibration mark) or that the company cheated us on the quantity but rather take a close look at the experiment and determine from a chemical point of view what could have contributed to the variance (max. 5 lines).*

\_\_

**Conclusions**

The % mass of salicylic acid in an acne cleanser was determined to be \_\_ with a % relative standard deviation of \_\_\_. This was \_\_ of the advertised value.

**References**

*Note that references must be informed below in the order they are cited in text. Reference #1 is already informed, but not yet cited. Add the necessary references below and cite them in text.*

1. Reimer, M. et al, *Laboratory Manual, Chemistry 101*, pp. \_\_\_\_. (University of Victoria: Victoria, B.C.). **Summer 2024**.
2. \_Clean & Clear Essentials Deep Cleaning Astringent. Johnson & Johnson Inc., Markham, Ontario, Canada, L3R 5L2, lot number 30038970, NPN 02072696 \_

|  |  |
| --- | --- |
| **Feedback Summary** | max. |
| **Pre-lab quiz:** Are all responses correct? | 4 |
| **Laboratory Notebook:** Have all data, observations, and procedures been recorded? | 1 |
| **Report (Results and Assessment):** Are all sections completed accurately and correctly? | 3 |
| **Participation:** Did the student come prepared, was the time used well in the lab and was the student engaged in the experiment? Did the students request the TA to check their drawers for completeness before they left the lab and show the TA the email of successful submission? | 1 |
| **Performance evaluation:** Did the student follow the safe practice guidelines throughout the whole lab period? | 1 |
| **Total mark** | 10 |

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