



Assignment #2 - LabReport1

i You cannot edit this entry after it is graded.

Description First lab report using template.

I worked in a group with Dazzo, Gina

The work for this assignment is in My notebook

Grade 9 / 10

Graded on Sep 01, 2023, 10:11 AM CDT

TITLE: (Insert experimental title here. All italicized text in parentheses should be followed and then deleted throughout this template).

Purpose: (Insert experimental purpose here).

Reference: Kotley, L. J., *Introduction to Chemistry in the Laboratory*, 20th Ed., Lake Forest College, 2023, Experiment 10, Appendix 10. (Edit the experiment title and/or appendix letter; add other references, if used, following the same format).

Observations and Data: (Write your clear, concise, complete, past tense, passive voice description or narrative of the experiment as the experiment is performed. Complete sentences are used throughout.)

If needed, insert tables and edit the header: Table 1. Preparation of Standard Solutions. If needed, insert figures and edit the caption below the figure: Figure 1. Beer's Law Plot of B12 Standard Solutions at $\lambda = 520$ nm. Number tables and figures in order of appearance in the report.)

Table 1. Mass data for B₁₂ solution preparations.

| Description (units) | Value |
|--|-------|
| Mass of B ₁₂ (pharmaceutical grade) (g) | |
| Mass of B ₁₂ (pharmaceutical grade) (mg) | |
| % mass of B ₁₂ in the B ₁₂ (pharmaceutical grade) form label | |
| Mass of B ₁₂ (pharmaceutical grade) in the glucose mixture (mg) | |
| Mass of B ₁₂ (pharmaceutical grade) (g) | |
| Mass of B ₁₂ (pharmaceutical grade) (mg) | |

Calculations: (Insert sample calculations here, if relevant. Otherwise, delete this section entirely.)

Table 2. Volumes and Concentrations.

| Vol # | Volume B ₁₂ solution, μ L | Volume H ₂ O, μ L | Total volume, μ L | Concentration, mg/mL |
|-------|--|----------------------------------|-----------------------|----------------------|
| 1 | 0 | 3000 | 3000 | 0 |
| 2 | | | 3000 | |
| 3 | | | 3000 | |
| 4 | | | 3000 | |
| 5 | 3000 | 0 | 3000 | |

Conclusion: (Summarize the quantitative values (percent error and/or CV) to indicate how well the goals of the experiment have been met; answer any questions in the experimental instructions, etc.).

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B12 Concentration Lab

The purpose of this lab is to create multiple three milliliter concentrations of a vitamin B12 and deionized water solution. ~~We will also learn to use precise measuring equipment and how to do concentration calculations.~~ OK start, but "learning" is never an experimental goal.

Reference Appendix A and Appendix D were used as a reference for this lab **Incomplete reference. See starting materials page entitled "notebook entries" for more info.**

Data & Observations

The B12 powder has a concentration of 10.12% B12. It is a pale pink powder with a mass of 0.0119 g or 11.9mg. **OK** When the deionized water was added it became a red liquid that lightened and became more pink as more solute **??** was added. A total of 10.00 (to 4 SF) mL of deionized water was added. The solution was gently mixed by inverting the vial 10 times and transferred to a 30mL beaker. Using pipette to do precise measurements, five vials with black lids were filled with 3 milliliters of B12 solution of different concentrations. The concentrations range from 1, pure deionized water, to 5, the original B12 solution. All concentrations were carefully measured, capped, and gently shaken. They were then labeled based on concentrations. As the solutions become less concentrated, they become lighter pink and more transparent. **OK**

A pale pink Nature Made brand B12 tablet with a weight of 0.3023g or 302.3 mg is crushed by folding it in glass paper and smashing it with a wooden block. Other ingredients of the tablet include cellulose gel, maltodextrin, croscarmellose sodium, and magnesium stearate. **OK** It also claims to have 500mcg of B12. The pink and white powder was then mixed with 10mL of deionized water to create an opaque pink solution. After waiting approximately 15 minutes the solution had settled, there were white chunks floating on the top of the solution and a white residue on the bottom of the vial. Approximately 5mL of solution was transferred into a centrifuge vial and placed in a centrifuge with a counter weight for 3 minutes. The remaining solution was transferred to a vial with a white cap and stored. After three minutes the solution had separated into two pink solutions. Both were more transparent than the original solution and there was a white sediment under the upper liquid. Not enough solution had separated after 3 minutes so it was returned to the centrifuge for another 5 minutes. The solution was then transferred in a vial with a black lid labeled 6.

You might need to add a table here to organize your data.

| Description (units) | Value |
|--|----------|
| Mass of B ₁₂ /glucose mixture (g) | 0.0104 g |
| Mass of B ₁₂ /glucose mixture (mg) | 10.4 mg |
| % mass of B ₁₂ in the B ₁₂ /glucose mixture from label | 10.12% |
| Mass of B ₁₂ (only) in the solid mixture (mg) | 1.05 mg |
| Mass of B ₁₂ tablet (g) | 0.3023 g |
| Mass of B ₁₂ tablet (mg) | 302.3 mg |

Table 1. Mass and % data.

Calculations

$10.4\text{mg} \times 0.1012 = 1.05\text{mg}$ of B12 in the B12/glucose mixture

$1.05\text{mg}/10\text{mL} = 0.105\text{ mg/mL}$ concentration of original B12 mixture and vial 5

$[0.105\text{ mg/mL} \cdot (750\text{mL})]/3\text{mL} = 0.0263\text{ mg/mL}$ concentration of vial 2

$[0.105\text{ mg/mL} \cdot (1.50\text{mL})]/3\text{mL} = 0.0535\text{ mg/mL}$ concentration of vial 3

$[0.105\text{ mg/mL} \cdot (2.25\text{mL})]/3\text{mL} = 0.0788\text{ mg/mL}$ concentration of 4

| Vial # | Volume B ₁₂ solution, μL | Volume H ₂ O, μL | Total Volume, μL | Concentration, mg/mL |
|--------|--|--|-----------------------------|----------------------|
| 1 | 0 | 3000 | 3000 | 0 |
| 2 | 750 | 2250 | 3000 | 0.0263 |

| Vial # | Volume B ₁₂ solution, μL | Volume H ₂ O, μL | Total Volume, μL | Concentration, mg/mL |
|--------|--|--|-----------------------------|----------------------|
| 3 | 1500 | 1500 | 3000 | 0.0535 |
| 4 | 2250 | 750 | 3000 | 0.0788 |
| 5 | 3000 | 0 | 3000 | 0.105 |

Table 2. Volumes and Concentrations.

Conclusions

Many B12 solutions were made for this lab with two different samples of B12. Mixing the vitamin B12 with deionized water created a pink solution. The more concentrated the B12 the darker pink the solution is. The glucose in the first sample of B12 did not affect the opacity of the solution but the additives in the Nature Made supplement made the solution cloudy.

OK, but what happened to your visualization?