**Layering Salt Solutions**

**Goal:**

The goal for this lab was to layer the liquids successfully, hoping that the liquids won’t sink down. The goal is to have the densest liquid on the bottom and least dense liquid on the top, so it won’t sink. The liquids are filled with salt. The liquids are filled with salt. The colors of the liquids are blue, green, red, and yellow.

**Prediction:**

Based on the mini trials, our group predicted that the densest to the least dense liquids (bottom to the top) is blue, yellow, green, and then red salt solution.

**Materials:**

* Blue salt liquid solution (150 ml)
* Green salt liquid solution (150 ml)
* Red salt liquid solution (150 ml)
* Yellow salt liquid solution (150 ml)
* Long straw
* 4 Pipettes (Each for every one)
* Short straw
* Calculator
* White plastic base
* Lab sheet
* Paper towel

**Procedure:**

1. Take out all the salt liquid solution beakers and place it on top of paper towels so it won’t get things wet.
2. Choose two salt solutions to experiment with the mini trials (short straw). If the two liquids don’t mix, then the results will be that the results will be that the two liquids formed layers. Then, the top liquid is least dense than the bottom one. If the liquids mix, then the top liquid id denser than the bottom liquid.
3. Do 3 or 4 trials and record the results on the lab sheet. Then, write the prediction.
4. Rinse and dry the liquid solutions and move on to the long straw.
5. Use the pipette and test the prediction.
6. Rinse and dry the liquid solutions and use the paper towel to clean up.
7. Clean up and put away materials.

*\*\*\*****Note:*** *To find density, divide mass (NET Mass) by volume.*

*Example: Mass= 48.9 gram Volume= 29 milliliter*

*Use a calculator and type in 48.9÷29 and press enter. The volume will turn out to be 1.69 g/ml (which is already rounded to the nearest hundredths)*

**Diagram of Lab Set-Up:**

**Data Chart:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Trial** | **Diagram** | **Results** | **Conclusion** |
| **1** | Green  Red | Formed Layers | Red is less dense than green. |
| **2** | Blue  Yellow | Formed Layers | Yellow is less dense than blue. |
| **3** | Yellow  Green | Formed Layers | Green is less dense than yellow. |
| **4** | Red  Yellow | Formed Layers | Yellow is less dense than red. |

**Successful Result:**

Red

Green

Yellow

Blue

**Chart:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Solution** | **Total Mass** | **Net Mass** | **Volume** | **Density** |
| Red | 56.7 g | 46.7 g | 50 ml | 0.93 g/ml |
| Yellow | 59.7 g | 49.7 g | 50 ml | 0.99 g/ml |
| Green | 56.8 g | 46.8 g | 50 ml | 0.94 g/ml |
| Blue | 61.1 g | 51.1 g | 50 ml | 1.02 g/ml |

**Conclusion:**

The data supports the original prediction made because the results (from densest to least dense/ bottom to top) was blue, yellow, green, and then red, this result was exactly the same as the original prediction.So the data supports the original prediction. The limitations that could have affected this lab are that the salt liquid solutions were not poured gently and slowly so the liquids can mix a little bit. Also, there might be math errors, like calculating the densities wrong. There also might be reading errors, like reading the measurements (total mass, net mass, and density) wrong.

This lab improves my understanding of the density of each layer of the atmosphere because the idea is that the bottom layer of the atmosphere (troposphere) is where most of the air molecules are included. The top of the atmosphere (exosphere) is where there is least air molecules contained. This goes to the same with the liquid salt solutions. The liquid with the most salt contained is on the bottom of the straw and the liquid with the least salt solution or no salt solution is on the top.