



Visualizing the Density of Different Liquids Using Juices

Student's Name

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Professor's Name

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Introduction

Liquids have varying densities based on the substance's mass per unit of volume. (Serway & Jewett, 2005) This experiment aims to test whether different juices have different densities based on the varying atom mass present in the liquid.

All three types of juices should be separated into three stripes visible in the glass. I would suppose that the pomegranate-blueberry juice will be at the bottom, the orange juice – in the middle, and the white grape juice – at the top. This hypothesis is based on the number of ingredients.

Materials

- 200 ml of white grape juice
- 200 ml of pomegranate-blueberry juice
- 200 ml of orange juice
- One tall glass
- Dropper
- *Liquid Density: Lab Manual* (2021).

Procedure

Pour the white grape juice into the glass to take up approximately 2 cm of space. Test the density of pomegranate-blueberry juice against the white grape juice by using a dropper to add a bit of it to the glass. The pomegranate-blueberry juice remains on top, which means it has a lower density than the white grape juice.



Remove the mix from the glass and repeat step one.

Use the dropper to add orange juice to the white grape juice to test how their densities compare. The former also floats on top of the white grape juice, meaning it has a lower density. It is necessary to test the pomegranate-blueberry juice against the orange juice. Remove the mix from the glass and add 2 cm of orange juice. Add pomegranate-blueberry juice using a dropper. It floats on top of the orange juice.

Results

The experiment showed that the pomegranate-blueberry juice had the lowest density, followed by orange juice and white grape juice. The latter was the densest of the three tested.

Conclusion

As the initial hypothesis was disproved, the number of ingredients isn't a strong predictor of the liquid's density. Similar experiments may be needed to test whether sugar contents contribute to the density of juices. Another experiment may also be required to see whether the same type of juice from different producers would show that they have similar density.



References

Serway, R., Jewett, J. (2005). *Principles of Physics: A Calculus-Based Text*. Cengage Learning.

Smith, D. (2021). *Liquid Density: Lab Manual*. UCLA Press Center.

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