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Density Lab Report 1.1

Research Questions

How Are Density Units Determined?

What is the real-world application of density?

Introduction

Density is defined mathematically as a ratio of a substance's mass and volume

$$\rho = \text{mass/volume}$$

It uses derived units; in chemistry, the derived units are usually g/mL or g/cm³. The latter is equivalent to the former because 1mL = 1 cm³.

Procedures

First we measured the mass of the gray plastic PVC Sample using an electronic scale. We filled our Graduated Cylinder with 50.0 mL of water and then slid the sample into the cylinder. We then Measured the new volume of the water, being careful each time to measure at the meniscus. Next we subtracted these two volumes to find the volume of the volume of the sample. The sample's mass was then divided by its volume to obtain its density. Each lab group announced their findings and a comparison was made.

Data/Observations

We weighed the mass of the PVC Sample to be 19.09 grams. The volume of the water in the Graduated Cylinder was 50.0 mL. Once we added the PVC sample, the new volume was measured to be 64.0 mL. We then subtracted the original volume of the cylinder (50.0 mL) by the new volume (64.0 mL), to find the volume of the PVC sample, which was 14.0 mL. We then divided the mass of the PVC sample (19.09 g) by its volume (14.0 mL) to find its density, which was 1.36 g/mL.

Conclusion

The units of density are determined by the units of mass divided by the units of volume. Units of mass are derived units, found via computation.

Density is a physical trait that determines if an object will sink or float in a liquid. If an object's density is greater than that of the liquid, it sinks, but if it is less than that of the liquid's it floats. The PVC sample had a greater density than water, so it sank

Vocabulary

1. Mass

The measure of the amount of matter of an object

2. Density

Mass per unit of volume

3. Buoyancy

The Tendency of an object to float or to rise in a fluid when submerged

4. Physical Property

A Physical characteristic that can be measured without modifying the substance's chemical composition