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Chemistry lab

Density Lab

Research questions

How are density units determined?

What is the Real-World application of density?

Introduction

Density is defined mathematically as the ratio of a substance 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 electric scale. We filled our graduated cylinder 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 obtain the samples volume. The sample's mass was divided by its volume to obtain density. Each lab group then announced their findings and a comparison of these was made.

Data/Observations

The mass of the PVC is 11.01g

The volume of the water is 50.0mL

The new volume of the water in the cylinder after we placed the PVC is 58mL

$$58.0\text{mL} - 50.0\text{mL} = 8.0\text{mL}$$

$$11.01\text{g divided by } 8.0 = 1.4\text{g/mL}$$

Conclusion

The units of density are determined by the units used for mass and volume and then dividing those units with their respective quantities. These are derived units, renowned by computation. Density is a physical trait that determines if an object will sink or float in a liquid. If the objects density is greater than the liquids density, it sinks. If the objects density is less than the liquids density, it floats. The PVC had a greater density than the water and therefore it sank.

Vocabulary

The definition of mass, mass measures how much matter exist in an object.

The definition of density is an objects mass divided by the volume that the object occupies.

The definition of buoyancy is tendency of an object to float or to rise in a fluid when submerged.

The definition of physical property is a characteristic of a substance that can be observed or measured without changing the identity of the substance.