

Student Name: Cora Stallings

Date: 09/19/23

Lab Title: Density Lab

Research Question:

What is the density of an object?

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 1 mL = 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 obtain the sample's 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.

Results:

1. The mass of the PVC was 11.01g.
2. The volume of H₂O in the cylinder was 50.0 mL.
3. The new volume of H₂O in the cylinder after we placed the PVC in was 58.0 mL

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

$$110.01 \text{ g} \div 8.0 \text{ mL} = 1.4 \text{ g/mL}$$

1.4 g/mL is the density of the PVC

Conclusions:

The units of density are determined by the units 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's density is greater than the liquid's density, it floats. The PVC had a greater density than the H₂O, and therefore it sank.

The definition of mass is: The amount of matter that exists in an object.

The definition of density is: An object's mass divided by the volume that the object occupies.

The definition of buoyancy: The tendency to remain afloat in a liquid or rise in air or gas.

The definition of physical property is: Any property used to characterize matter and energy and their interactions.