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Density Lab

Question: What is the density of the PVC sample?

Introduction: Density is defined mathematically as the ratio of a substances mass and volume:

$$D = Mass / Volume$$

It uses derived units; in chemistry, the derived units are usually g/mL or g/cm^3. The latter is equivalent to the former because $1 \text{ mL} = 1 \text{ cm}^3$.

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 the 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: PVC mass = 19.11g   Volume of Water = 50mL   New Volume = 64mL

Calculating Displacement 64mL – 50mL = 14mL   Displacement = 14mL

Calculating Density 19.11g / 14mL = 1.365g/mL

Density = 1.4 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 sinks. If an 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 H_2O, and therefore it sank. The density of the PVC was 1.4 g/mL.

Mass – The measurement of the amount of matter in an object

Density – An object's mass divided by the volume that the object occupies

Buoyancy – The tendency of an object to float or to rise in a fluid when submerged

Physical Property – A characteristic of a substance that can be observed or measured without changing the identity of the substance