

Calculating Density



Calculating Density



Sample Problem

Find the density of a 10 g mass of a substance that has a volume of 2.0 cm³.

- Write the formula for density. $D = \frac{m}{V}$
- In place of m for mass, write 10 g. $D = \frac{10 \text{ g}}{V}$
- In place of V for volume, write 2.0 cm³. $D = \frac{10 \text{ g}}{2.0 \text{ cm}^3}$
- Carry out the division.
That is, divide 10 by 2.0. $D = 5.0 \frac{\text{g}}{\text{cm}^3}$

The density of the substance is 5.0 g/cm³.



Calculating Volume



Sample Problem

You want to put 10.0 g of salt into a container. What is the volume of the container if the salt completely fills it?

- Write for formula for volume when you know the mass and density. $V = \frac{m}{D}$
- Look up the density of salt in Table 8.1. $D = 2.16 \text{ g/cm}^3$
- In place of m for mass, put 10.0 g. $V = \frac{10.0 \text{ g}}{D}$
- In place of D for density, put 2.16 g/cm^3 . $V = \frac{10.0 \text{ g}}{2.16 \text{ g/cm}^3}$
- Carry out the division.
That is, divide 10.0 by 2.16. $V = 4.63 \text{ cm}^3$

The volume of 10.0 g of salt is 4.63 cm^3 . The container holds 4.63 cm^3 .



Calculating Mass



Sample Problem

What is the mass of 1500 mL of helium?

- Write the formula for $m = VD$
mass when you know
the volume and density.
- Look up the density $D = 0.0002 \text{ g/mL}$
of helium in Table 8.1 .
- In place of V for volume, $m = (1500 \text{ mL})D$
write 1500 mL.
- In place of D for density, $m = (1500 \text{ mL})(0.0002 \text{ g/mL})$
write 0.0002 g/mL.
- Carry out the $m = 0.3 \text{ g}$
multiplication. That is,
multiply 1500 by 0.0002.

The mass of 1500 mL of helium is 0.3 g.

Table 8.1 Approximate Densities of Common Fluid Substances and Solid Substances

Fluid	Density (g/mL)	Solid	Density (g/cm ³)
hydrogen	0.00009	styrofoam	0.005
helium	0.0002	cork	0.24
air	0.0013	oak	0.70
oxygen	0.0014	sugar	1.59
carbon dioxide	0.002	salt	2.16
ethyl alcohol	0.79	aluminum	2.70
machine oil	0.90	iron	7.87
water	1.00	nickel	8.90
seawater	1.03	copper	8.92
glycerol	1.26	lead	11.34
mercury	13.55	gold	19.32