

Density:

- ① Calculate the density of a substance that weighs 4.50g and has a volume of 2.96L.

First - convert L \rightarrow mL $2.96\cancel{\text{L}} \times \frac{1000\text{ mL}}{1\cancel{\text{L}}} = 2.96 \times 10^3\text{ mL}$

$$d = \frac{m}{V} = \frac{4.50\text{ g}}{2.96 \times 10^3\text{ mL}} = \frac{1.67286 \times 10^{-3}\text{ g/mL}}{1} = \boxed{1.67\text{ g/mL} \times 10^{-3}\text{ g/mL}}$$

- ② A shiny metal has a mass of 30.01g. Its volume is determined by placing in a graduated cylinder contained 56.3 mL of water. The volume after the metal is placed is 62.6 mL. What is the density of the metal?

$$\text{Volume of metal} = (62.6 - 56.3)\text{ mL} = 6.3\text{ mL}$$

$$d = \frac{m}{V} = \frac{30.01\text{ g}}{6.3\text{ mL}} = 4.76349\text{ g/mL} = \boxed{4.8\text{ g/mL}}$$

- ③ What is the weight of 3.00 mL of liquid if its density is 1.29 g/mL.

$$d = \frac{m}{V}$$

cross multiplication

$$m = d \times V$$
$$= 1.29\frac{\text{g}}{\text{mL}} \times 3.00\text{ mL}$$
$$= \boxed{3.87\text{ g}}$$

dimensional analysis

$$3.00\text{ mL} \times \frac{1.29\text{ g}}{1\text{ mL}} = \boxed{3.87\text{ g}}$$

$$\frac{1.29\text{ g}}{1\text{ mL}}$$

or

$$\frac{1\text{ mL}}{1.29\text{ g}}$$