

Chemistry 11

Density Worksheet

Directions: Answer in the space provided. Be sure to show ALL your work.
Have fun and remember Chem-is-try ☺

1. A 350.0 mL chunk of boron has a mass of 8.19g. What is the density of boron?

$$D = \frac{m}{V} = \frac{8.19g}{350.0mL} = 0.0234g/mL$$

2. Alcohol has a density of 0.789 g/mL. What volume of alcohol is needed if you require 49 g of alcohol?

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

$$V = \frac{m}{D} = \frac{49g}{0.789g/mL} = 62.1 mL$$

3. Beeswax has a density of 961 g/L. If a block of beeswax has a volume of 200.0 mL, what is the mass of the block?

$$V = 200.0mL \times \frac{L}{1000mL}$$

$$= 0.2000L$$

4. 25.0 mL's of w, x, y and z are poured into a 150.0 ml graduated cylinder. Each of the 4 compounds is a liquid and each one will not dissolve in the other. If 55.0 mL of w has a mass of 107.3 g, 12.0 mL of x has a mass of 51.8g, 42.5 mL of y has a mass of 46.8g and 115.0 mL of z has a mass of 74.8g, list the layers found in the cylinder (from top to bottom. Hint - Find the densities!!!)

<u>w</u>	<u>x</u>	<u>y</u>	<u>z</u>
$D = \frac{107.3g}{55mL}$	$D = \frac{51.8g}{12mL}$	$D = \frac{46.8g}{42.5mL}$	$D = \frac{74.8g}{115.0mL}$

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

Name: _____

Block: _____

5. The density of copper is 8.92g/mL and the density of magnesium is 1.74g/mL. What mass of magnesium occupies the same volume as 100.0g of copper?

$$\begin{aligned} D_{Cu} &= 8.92 \text{ g/mL} & D_{Mg} &= 1.74 \text{ g/mL} \\ V &= \frac{m}{D} = \frac{100 \text{ g}}{8.92 \text{ g/mL}} & m &= DV \\ &= 11.2 \text{ mL} & &= 1.74 \frac{\text{g}}{\text{mL}} \times 11.2 \text{ mL} \\ & & &= 19.51 \text{ g} \quad \text{sig figs} \quad \boxed{m = 19.5 \text{ g}} \end{aligned}$$

6. The density of ice is 0.920 g/mL. Calculate the mass of ice an ice block that has the following dimensions, 4 cm x 3 cm x 4 cm. (1 mL = 1 cm³)

$$\begin{aligned} m &= DV \\ &= \left(0.920 \frac{\text{g}}{\text{mL}} \right) (4 \text{ cm} \times 3 \text{ cm} \times 4 \text{ cm}) \quad \boxed{m = 44.2 \text{ g}} \\ &= 0.920 \frac{\text{g}}{\text{mL}} \times 48 \text{ cm}^3 = 44.16 \text{ g} \end{aligned}$$

7. A sample of mercury has a mass of 6.00×10^4 g. If the density of mercury is 13.6 g/mL, what is the volume, in liters, of the sample?

$$\begin{aligned} m &= 6.00 \times 10^4 \text{ g} & V &= \frac{m}{D} = \frac{6.00 \times 10^4 \text{ g}}{13.6 \text{ g/mL}} \\ D &= 13.6 \frac{\text{g}}{\text{mL}} & &= 441 \text{ mL} \quad \boxed{V = 0.441 \text{ L}} \\ V &= ? & & 441 \text{ mL} \times \frac{1 \text{ L}}{1000 \text{ mL}} = 0.441 \text{ L} \end{aligned}$$

8. A diamond has a density of 3.51×10^3 g/L. If a diamond has a volume of 0.440 mL, calculate the mass of the diamond.

$$\begin{aligned} D &= 3.51 \times 10^3 \text{ g/L} & m &= DV \\ V &= 0.440 \text{ mL} & &= 3.51 \times 10^3 \frac{\text{g}}{\text{L}} \times 0.440 \text{ mL} \times \frac{\text{L}}{1000 \text{ mL}} \\ m &= ? & &= 3.51 \times 10^3 \frac{\text{g}}{\text{L}} \times 0.440 \times 10^{-3} \text{ L} \\ & & &= 1.54 \text{ g} \end{aligned}$$