



Chem Skills Worksheet #7: Density Calculations

Directions: Show all work. Always include units. A number without a unit has no meaning.

1. A sample of seawater has a mass of 158 grams and has a volume of 156 ml. What is the density? $158\text{g}/156\text{mL}$
2. A cylindrical box with a volume of 200.0 cm^3 holds 432 g of sodium chloride. Calculate the density of the salt
3. What is the mass of ethyl alcohol that fills a 200.0 ml container? The density of ethyl alcohol is 0.789 g/ml. $D=M/V, M=DV$
4. An aluminum bar has mass 242 g. What is its volume? $d = 2.70\text{ g/mL}$
5. A flask that has a mass of 345.8 g is filled with 225 ml of carbon tetrachloride. The mass of the flask and carbon tetrachloride is found to be 703.55 g. Calculate the density.
6. A block of lead has dimensions of 4.50 cm by 5.25 cm by 6.05 cm. The block has a mass of 1587 g. From this information, calculate the density.
7. Calculate the mass of 100.0 mL of concentrated nitric acid (density = 1.42 g/mL) $142\text{g/mL} \times 100.0\text{ mL} =$
8. 28.5 g of iron shot is added to a graduated cylinder containing 45.5 ml of water. The water level rises to the 49.1 ml mark. Calculate the density of iron.
9. The hydrogen stored inside a large weather balloon weighs 13.558 g. What is the volume of this balloon if the density of hydrogen is 0.089 g/L? $13.558\text{g}/.089\text{g/L}$
11. What is the volume of a 23.9 g piece of gold, $d = 19.3\text{ g/mL}$? $D=M/V, V=M/D, 23.9\text{ g} / 19.3\text{ g/mL}$
12. Mercury has a density of 13.6 kg/liter. What mass of Mercury is needed to fill a container that is 4.5 cm x 6.4 cm x 3.8cm?
13. Osmium metal has a density =22.0 g/mL. What volume would be necessary to hold of 2.50 kg of Osmium? $(2.50\text{kg} \times 1000\text{g}/1\text{Kg}) / 22.0\text{ g/mL}$
14. Concentrated sulfuric acid has a density 1.84 kg/L. What is the mass of 500.0 mL of Concentrated sulfuric acid?
15. Gasoline has a density of 5.83 pounds per gallon. What volume tank would you need to store three tons of gasoline? $V=\text{mass}/\text{density} = 3\text{tons}/5.83\text{ lbs/gallon} \times 2000\text{lbs/ton}$