Density Worksheet   Name: ___KEY___.

1. A 3.5mL chunk of boron has a mass of 8.19g. Calculate the density of the boron in g/mL.

$$d = \frac{M}{V} = \frac{8.19g}{3.5mL} = 2.3\ g/mL$$

2. A pure iron bar has a mass of 125g. If the density of iron is 7.86 x 10³g/L, what is the volume of the iron bar in L, mL, and cm³?

$$V = \frac{M}{d} = \frac{125g}{7.86\times10^3 g/L} = \underline{0.0159\ L} = \underline{15.9\ mL} = \underline{15.9\ cm^3}$$

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

$$M = dv = (961g)(0.2000L) = \underline{192g}$$

4. The noble gas neon is contained in a glass bulb having a volume of 22.4L. If the density of neon is 0.900g/L, what is the mass (g) of the neon in the bulb?

$$m = dv = (0.900\ g/L)(22.4L) = \underline{20.2g}$$

5. A 70.0g sphere of manganese (density = 7.20 x 10³g/L) is dropped into a graduated cylinder containing 54.0mL of water. What volume of water will be displaced in mL?

$$V = \frac{m}{d} = \frac{70.0g}{7.20\times10^3 g/L} = 9.72\times10^{-3}L = \underline{9.72\ mL}\ \text{will be displaced}.$$

6. The density of steel is 7.80g/cm³. If you have a 56cm³ piece of steel, what is its mass (g)?

$$M = dv = (7.80\ g/cm^3)(56\ cm^3) = \underline{4.4\times10^2\ g}$$

7. If the density of brick is 1.84g/cm³ and the density of aluminum is 2.70g/cm³, what mass (g) of aluminum occupies the same volume as 150.0g of brick?

$$V_{brick} = \frac{M}{d} = \frac{150.0g}{1.84 g/cm^3} = \underline{81.522\ cm^3}\quad M_{Al} = dv = (2.70\ g/cm^3)(81.522\ cm^3) = 220g$$

8. If the density of copper is 8.92 x 10³g/L and the density of magnesium is 1.74 x 10³g/L, what mass (g) of magnesium occupies the same volume as 100.0g of copper? $= 2.20\times10^2\ g$

$$V_{copper} = \frac{M}{d} = \frac{100.0g}{8.92\times10^3 g/L} = \underline{0.01121\ L}\quad M_{Mg} = dv = (1.74\times10^3 g/L)(0.01121\ L) = \underline{19.5g}$$

9. Ice has a density of 0.92g/cm³. If it is put in 200.0mL of an unknown alcohol which has a mass of 190.3g, will the ice sink or float? Why?

$$d_{Alcohol} = \frac{M}{V} = \frac{190.3g}{200.0mL} = 0.9515\ g/mL = 0.9515\ g/cm^3$$

Ice will float as its density is less than that of alcohol.

10. If you increase the air pressure inside of a bottle, does the density of the air inside increase or decrease? Why?

Increase — more mass per unit space