

Chemistry 1 H
Practice Test Chapter 2: Problem Solving: 65 Points

- Write the number 0.065700 in scientific notation. 6.5700×10^{-2} . (2)
- How many significant figures are there in number 1 (above)? 5. (3)

Perform the following conversions using a dimensional analysis grid. Circle your answers.

- Convert 30.0 miles to km. (5 points) *(3 sig figs!)*

$$\frac{30.0 \cancel{\text{mi}}}{1} \times \frac{1.609 \text{ km}}{1 \cancel{\text{mi}}} = \boxed{48.3 \text{ km}}$$

- Convert 5000 mL to ft³ (5 points) *(1 sig fig!)*

$$\frac{5000 \cancel{\text{mL}}}{1} \times \frac{1 \cancel{\text{cm}^3}}{1 \cancel{\text{mL}}} \times \frac{(1 \text{ ft})^3}{(30.48 \text{ cm})^3} = 0.177 \rightarrow \boxed{0.2 \text{ ft}^3}$$

(30.48)³ in your calculator!

- An aspirin tablet contains 325 mg of acetaminophen. How many grains is this equivalent to? (1 gram = 15.432 grains) (5 points) *(3 sig figs)*

$$\frac{325 \cancel{\text{mg}}}{1} \times \frac{1 \cancel{\text{g}}}{1000 \cancel{\text{mg}}} \times \frac{15.432 \text{ grains}}{1 \cancel{\text{g}}} = \boxed{5.02 \text{ grains}}$$

- The density of water in SI units is 1.00 g/mL. What is the density of water in lbs. per ft³? (5 points) *(3 sig figs!)*

$$\frac{1.00 \cancel{\text{g}}}{1 \cancel{\text{mL}}} \times \frac{1 \text{ lb}}{453.6 \cancel{\text{g}}} \times \frac{1 \cancel{\text{mL}}}{1 \cancel{\text{cm}^3}} \times \frac{(1 \text{ ft})^3}{(30.48 \text{ cm})^3} = \boxed{\frac{62.4 \text{ lb}}{\text{ft}^3}}$$

30.48³ in your calculator!

6. You are given a bottle that contains 6.50 mL of a yellow liquid. The total mass of the bottle and the liquid is 11.51 g. The mass of the empty bottle is 5.29g. What is the specific gravity of the liquid? (10 points)

$$\text{mass liquid} = 11.51\text{g} - 5.29\text{g} = 6.22\text{g}$$

$$\text{Volume liquid} = 6.50\text{ mL}$$

$$D = \frac{M}{V} = \frac{6.22\text{g}}{6.50\text{mL}} = 0.957\frac{\text{g}}{\text{mL}}$$

$$\boxed{\text{S.G.} = 0.957}$$

3 sig figs

7. 1.00 lb of coffee beans yields 50.00 cups of coffee. How many mL of coffee can be obtained from 2.00 grams of coffee? (10 points)

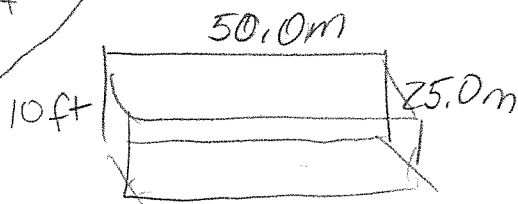
want mL on top! Find $\frac{\text{mL}}{\text{g}}$ then multiply $\times 2.00\text{g}$

$$\frac{50.00\text{ cup} \mid 1\text{ qt} \mid \text{L} \mid 1000\text{ mL} \mid 1\text{ lb}}{1.00\text{ lb} \mid 4\text{ cup} \mid 1.06\text{ qt} \mid \text{L} \mid 453.6\text{ g}} = 26.0\frac{\text{mL}}{\text{g}}$$

$$\frac{26.0\text{ mL}}{\text{g}} \times 2.00\text{g} = \boxed{52.0\text{ mL}}$$

8. An Olympic size pool is 50.0 m long and 25.0 m wide. What is the mass in kilograms of the water required to fill the pool to a depth of 10.0 ft? (10 points) Find volume in L

$$3.81 \times 10^6 \text{ Kg}$$



$$V = 50.0\text{m} \times 25.0\text{m} \times \frac{10.0\text{ft}}{3.28084} = 3.81 \times 10^3 \text{ m}^3$$

$$V = \frac{3.81 \times 10^3 \text{ m}^3 \mid 1\text{ L}}{1 \times 10^{-3} \text{ m}^3} = 3.81 \times 10^6 \text{ L}$$

$$D = \frac{M}{V} \Rightarrow m = D \cdot V \quad D_{\text{H}_2\text{O}} = 1\text{ g/mL}$$

$$m = \frac{3.81 \times 10^6 \text{ L} \mid 1000\text{ mL} \mid 1\text{ g} \mid 1\text{ Kg}}{1\text{ L} \mid \text{mL} \mid 1000\text{ g}} = \boxed{3.81 \times 10^6 \text{ Kg}}$$

3 sig figs

\nearrow
D_{H₂O}