

CHEM 106 Chapter 2 Conversions

Metric System

1. Provide the numbers to make each metric equality equal.

$$1 \text{ mg} = \underline{.001} \text{ g}$$

$$\underline{1} \text{ kg} = \underline{1000} \text{ g}$$

$$\underline{1} \text{ cm} = \underline{.01} \text{ m}$$

$$\underline{10^6} \text{ L} = \underline{1} \text{ } \mu\text{L}$$

$$1 \text{ L} = \underline{1000} \text{ mL}$$

$$\underline{1} \text{ nm} = \underline{10^{-9}} \text{ m}$$

$$\underline{10^6} \text{ s} = \underline{1} \text{ Ms}$$

$$(1 \text{ cm} = .01 \text{ m}) \cdot 100 \\ 100 \text{ cm} = 1 \text{ m}$$

$$(.001 \text{ L} = 1 \text{ mL}) \cdot 1000 \\ 1 \text{ L} = 1000 \text{ mL}$$

ONE STEP CONVERSIONS

2. Convert each:

a. 10.2 cm to m

$$\textcircled{3} \quad 10.2 \cancel{\text{cm}} \times \frac{\overset{\text{exact}}{.01 \text{ m}}}{1 \cancel{\text{cm}}} = \boxed{0.102 \text{ m}} \quad \textcircled{1.02 \times 10^{-1} \text{ m}}$$

$1 \text{ cm} = .01 \text{ m}$

b. 12 fl oz to pt

$$\textcircled{2} \quad 12 \cancel{\text{fl oz}} \times \left(\frac{1 \text{ pt}}{16 \cancel{\text{fl oz}}} \right) = \textcircled{0.75 \text{ pt}}$$

$1 \text{ pt} = 16 \text{ fl oz}$
exact

c. 355.0 mL to L

$$\textcircled{4} \quad 355.0 \cancel{\text{mL}} \times \frac{\overset{\text{exact}}{.001 \text{ L}}}{1 \cancel{\text{mL}}} = \boxed{\overset{\times}{0.3550 \text{ L}}} \quad \textcircled{3.550 \times 10^{-1} \text{ L}}$$

MULTISTEP CONVERSIONS

3. Convert each:

a. 259 grams = 9.14 oz

$$259 \text{ g} \times \frac{1 \text{ lb}}{453.6 \text{ g}} = 0.570987 \text{ lb}$$

(3) (4)

$$0.570987 \text{ lb} \times \frac{16 \text{ oz}}{1 \text{ lb}} = 9.14 \text{ oz}$$

exact

b. 2h, 20 min = _____ μs

\downarrow 120 min + 20 min

$$= 140 \text{ min} \times \frac{60 \text{ s}}{1 \text{ min}} \times \frac{1 \mu\text{s}}{10^6 \text{ s}} = 8.4 \times 10^9 \mu\text{s}$$

(2)

c. 5 ft, 7.5 in = _____ cm

$$60 + 7.5 = 67.5 \text{ in} \times \frac{2.54 \text{ cm}}{1 \text{ in}} = 171.45 \text{ cm}$$

(3) exact

d. 12 fl oz = _____ mL

floz. \nearrow L \rightarrow mL

$$12 \text{ fl oz} \times \frac{1 \text{ qt}}{32 \text{ fl oz}} \times \frac{1 \text{ L}}{1.0567 \text{ qt}} \times \frac{1 \text{ mL}}{.001 \text{ L}} = 354.878395 \text{ mL}$$

(2) exact (5) exact

350 mL