Exercise 72

Complete the following conversions between SI units.

(a) 612 g = _____ mg

(b) 8.160 m = _____ cm

(c) 3779 μg = _____ g

(d) 781 mL = _____ L

(e) 4.18 kg = _____ g

(f) 27.8 m = _____ km

(g) 0.13 mL = _____ L

(h) 1738 km = _____ m

(i) 1.9 Gg = _____ g

Solution

The SI prefixes are listed in Table 1.3 on page 31. Write each number in scientific notation and use conversion factors to get the appropriate units.

(a) $612 \text{ g} = 6.12 \times 10^2 \cancel{\text{g}} \times \dfrac{1000 \text{ mg}}{1 \cancel{\text{g}}} = 6.12 \times 10^5 \text{ mg}$

(b) $8.160 \text{ m} = 8.160 \cancel{\text{m}} \times \dfrac{100 \text{ cm}}{1 \cancel{\text{m}}} = 8.160 \times 10^2 \text{ cm}$

(c) $3779 \ \mu\text{g} = 3.779 \times 10^3 \cancel{\mu\text{g}} \times \dfrac{1 \text{ g}}{10^6 \cancel{\mu\text{g}}} = 3.779 \times 10^{-3} \text{ g}$

(d) $781 \text{ mL} = 7.81 \times 10^2 \cancel{\text{mL}} \times \dfrac{1 \text{ L}}{1000 \cancel{\text{mL}}} = 7.81 \times 10^{-1} \text{ L}$

(e) $4.18 \text{ kg} = 4.18 \cancel{\text{kg}} \times \dfrac{1000 \text{ g}}{1 \cancel{\text{kg}}} = 4.18 \times 10^3 \text{ g}$

(f) $27.8 \text{ m} = 2.78 \times 10^1 \cancel{\text{m}} \times \dfrac{1 \text{ km}}{1000 \cancel{\text{m}}} = 2.78 \times 10^{-2} \text{ km}$

(g) $0.13 \text{ mL} = 1.3 \times 10^{-1} \cancel{\text{mL}} \times \dfrac{1 \text{ L}}{1000 \cancel{\text{mL}}} = 1.3 \times 10^{-4} \text{ L}$

(h) $1738 \text{ km} = 1.738 \times 10^3 \cancel{\text{km}} \times \dfrac{1000 \text{ m}}{1 \cancel{\text{km}}} = 1.738 \times 10^6 \text{ m}$

(i) $1.9 \text{ Gg} = 1.9 \cancel{\text{Gg}} \times \dfrac{10^9 \text{ g}}{1 \cancel{\text{Gg}}} = 1.9 \times 10^9 \text{ g}$