Ch 1 Exercises

37) a) homogeneous mixture b) pure sub. (cmpd)
c) pure sub (element) d) heterogeneous mix

41) a) pure (cmpd) b) hetero mix c) homo mix d) pure (element)

42) a) pure (element) b) homo mix c) pure (cmpd) d) pure (cmpd)

43) a, c, d, e − pp b − cp 44) a, b, e − pp c, d − cp

44) a, b, e − pp c, d − cp 47) a, c, d − cc b − pc

48) a, d − cc b, c − pc 50) a, c − pc b − cc

51) a) $°C = \dfrac{°F - 32}{1.8}$ $32°F = 0°C$ b) $77K = -196°C$ $°F = 1.8°C + 52$

$= -321°F$

c) $°C = \dfrac{-109°F - 32}{1.8} = -78.3°C$ d) $°C = \dfrac{98.6 - 32}{1.8} = 37°C + 273 = 310K$

53) $°C = \dfrac{-80. - 32}{1.8} = \dfrac{-112°C}{1.8} = -62.2°C + 273 = 210.9K$

(5) $D = \dfrac{m}{V} = \dfrac{2.49g}{0.349cm^3} = 7.13 g/cm^3$ No $< 8.96 g/cm^3$

67) $D = \dfrac{4.10 \times 10^3 g}{3.25L} \times \dfrac{1L}{1000 cm^3} = 1.26\ g/cm^3$

68) $D = \dfrac{371g}{19.3mL} = 19.2 g/mL$ yes

72) $10.0\ lbs \times \dfrac{454g}{1b} \times \dfrac{1cm^3}{0.918g} = 4950\ cm^3$ $301 in^3$ $0.175 ft^3$

73) a) 73.2 mL b) 88.2°C c) 645 mL

77) a) 3 b) 3 c) 3 d) 5 e) 1 78) a) 4 b) ∞ c) 4 d) 1 e) 3

80) a) 9 b) ∞ c) 3 d) ∞

87) a) 58.710078   b) $\dfrac{63.811}{0.0059} = 11,000$ or 1.1×10^4
$+ 332.58$
391.290078 391.3

c) 0.518 9014   d) 59135.02
$+ 5.44$ $+ 144.99$ 59300
5.96 59280.01

88) a) 6.463878

$+7.33$

13.8

b) $336.89 \div 5.3 = 64$

c) $9478.1 (8.1 \times 10^6) = 7.7 \times 10^{10}$

d) 7.651238

-2.34

5.31

89) a) $27.8 L \times \dfrac{1000 cm^3}{1 L} = 2.78 \times 10^4 cm^3$

b) $1898 mg \times \dfrac{1g}{1000 mg} \times \dfrac{1 Kg}{1000 g} = 1.898 \times 10^{-3} Kg$

c) $198 Km \times \dfrac{1000 m}{1 Km} \times \dfrac{100 cm}{1 m} = 1.98 \times 10^7 cm$

91) a) $1.54 cm \times \dfrac{1 in}{2.54 cm} = 60.6 in$

b) $3.14 Kg \times \dfrac{1000 g}{1 Kg} = 3140 Kg$

c) $3.5 L \times \dfrac{1.06 qt}{1 L} = 3.7 qt$

d) $109 mm \times \dfrac{1 m}{1000 mm} \times \dfrac{100 cm}{1 m} \times \dfrac{1 in}{2.54 cm} = 4.29 in$

93) $10.0 Km \times \dfrac{1000 m}{1 Km} \times \dfrac{100 cm}{1 m} \times \dfrac{1 in}{2.54 cm} \times \dfrac{1 ft}{12 in} \times \dfrac{1 mi}{5280 ft} \times \dfrac{1 hr}{7.5 mi} \times \dfrac{60 min}{hr}$

$= 50 min$

95) $\dfrac{17 Km}{1 L} \times \dfrac{0.62 mi}{1 Km} \times \dfrac{3.785 L}{1 gal} = 40. mi/gal$ or $1.06 qt = 1 L$ $4 qt = 1 gal$

102) a) $954 \times 10^6 ac \times \dfrac{43560 ft^2}{1 ac} \times \dfrac{(1 mi)^2}{(5280 ft)^2} = 1.49 \times 10^6 mi^2$

b) $\% = \dfrac{1.49 \times 10^6 mi^2}{3.537 \times 10^6 mi^2} \times 100 = 42.1 \% \ farmland$

104) $14 lb \times \dfrac{1 Kg\,body}{2.2 lb} \times \dfrac{10 mg}{1 Kg\,body} \times \dfrac{5.0 mL}{100 mg} = 4.1 mL$

105) $1 solar\,yr \times \dfrac{365.24 day}{1 yr} \times \dfrac{24 hr}{1 day} \times \dfrac{60 min}{1 hr} \times \dfrac{60 sec}{1 min} = 3.1557 \times 10^7 sec$

106) a,e extensive   b,c,d intensive

106) $^\circ C = \dfrac{^\circ F - 32}{1.8}$ $^\circ C = ^\circ F = x$

$x = \dfrac{x - 32}{1.8}$ $1.8x = x - 32$

$0.8x = -32$

123) $15 L \times \dfrac{1.06 qt}{1 L} \times \dfrac{1 gal}{4 qt} \times \dfrac{52 mi}{1 gal} \times \dfrac{1 Km}{0.62 mi}$

$= 330 Km$ $x = -40^\circ$

125) $1.0 \times 10^{-13} cm \times \dfrac{1 m}{100 cm} = 1.0 \times 10^{-15} m$ $52.9 pm \times \dfrac{1 m}{10^{12} pm} = 5.29 \times 10^{-11} m$

$\% V = \dfrac{4/3 \pi r^3}{4/3 \pi r^3} = \dfrac{r^3}{r^3} \times 100 = \dfrac{(1.0 \times 10^{-15} m)^3}{(5.29 \times 10^{-11} m)^3} \times 100 = 6.8 \times 10^{-13} \%$

129) $\dfrac{2.40 g\ Na}{1 day} \times \dfrac{100 g\ NaCl}{39.33 g\ Na} \times \dfrac{100 g\ Mix}{1.25 g\ NaCl} = 488 g\ Mix/day$

133) $1.75 L\ \overset{N_2}{\ } \times \dfrac{1000 mL}{1 L} \times \dfrac{0.808 g\ N_2}{1 mL} \times \dfrac{1 L}{1.115 g} \overset{gas}{\ } = 1.229565 \times 10^5 L\ N_2\ gas$

$\overset{\ }{g}\left(\overset{\ }{liq}\right) = g(gas)$

$V_{room} = l \times w \times h = 10.00 m \times 10.00 m \times 2.50 m \times \dfrac{(100 cm)^3}{1 m^3} \times \dfrac{1 L}{1000 cm^3}$

$\dfrac{V_{gas}}{V_{room}} = \dfrac{1.229565 \times 10^5 L}{2.50 \times 10^5 L} = 0.492\ displaced$ 　$= 2.50 \times 10^5 L$

139) $8 hr \times \dfrac{60 min}{1 hr} \times \dfrac{20 breath}{1 min} \times \dfrac{0.50 L\ air}{1 breath} \times \dfrac{15.0 L\ co}{1 \times 10^6 L\ air} \times \dfrac{1.2 g\ CO}{1 L\ co} \times \dfrac{1000 mg\ CO}{1 g\ CO} = \underline{86.4 mg\ CO}$

$\boxed{9 \times 10^1\ mg}$