Ch 1 pgs 37-43

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) $°C = \frac{°F - 32}{1.8}$ $32°F = 0°C$ b) $77K = -196°C$ $°F = 1.8°C + 32$
$= -321°F$

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

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

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

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

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

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

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) 1 c) 4 d) 7 e) 3

80) a) 9 b) ∞ c) 3 d) ∞

87) a) $58.\underline{7}10078 + 332.58 = 391.\underline{2}90078$ 391.3

b) $\frac{63.\underline{8}11}{0.0059} = 11{,}000$ or 1.1×10^4

c) $0.51\underline{8}9014 + 5.44 = 5.96$

d) $59\underline{1}35.02 + 144.99 = 59280.01$ 59300

88) a) $6.463878 + 7.33 = 13.8$ b) $336.89 \div 5.3 = 64$ c) $9478.1\,(8.1\times10^{6}) = 7.7\times10^{10}$

d) $7.651238 - 2.34 = 5.31$

89) a) $27.8\,L \times \frac{1000\,cm^3}{1\,L} = 2.78\times10^{4}\,cm^3$ b) $1898\,mg \times \frac{1\,g}{1000\,mg} \times \frac{1\,Kg}{1000\,g} = 1.898\times10^{-3}\,Kg$

c) $198\,Km \times \frac{1000\,m}{1\,Km} \times \frac{100\,cm}{1\,m} = 1.98\times10^{7}\,cm$

91) a) $1.54\,cm \times \frac{1\,in}{2.54\,cm} = 60.6\,in$ b) $3.14\,Kg \times \frac{1000\,g}{1\,Kg} = 3140\,Kg$

c) $3.5\,L \times \frac{1.06\,qt}{1\,L} = 3.7\,qt$ d) $109\,mm \times \frac{1\,m}{1000\,mm} \times \frac{100\,cm}{1\,m} \times \frac{1\,in}{2.54\,cm} = 4.29\,in$

93) $10.0\,Km \times \frac{1000\,m}{1\,Km} \times \frac{100\,cm}{1\,m} \times \frac{1\,in}{2.54\,cm} \times \frac{1\,ft}{12\,in} \times \frac{1\,mi}{5280\,ft} \times \frac{1\,hr}{7.5\,mi} \times \frac{60\,min}{hr} = 50\,min$

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

100) a) $954\times10^{6}\,ac \times \frac{43560\,ft^2}{1\,ac} \times \frac{(1\,mi)^2}{(5280\,ft)^2} = 1.49\times10^{6}\,mi^2$

b) $\% = \frac{1.49\times10^{6}\,mi^2}{3.537\times10^{6}\,mi^2} \times 100 = 42.1\%$ farmland

101) $14\,lb \times \frac{1\,Kg\ body}{2.2\,lb} \times \frac{10\,mg}{1\,Kg\ body} \times \frac{5.0\,mL}{100\,mg} = 4.1\,mL$

103) $1\,solar\,yr \times \frac{365.24\,day}{1\,yr} \times \frac{24\,hr}{1\,day} \times \frac{60\,min}{1\,hr} \times \frac{60\,sec}{1\,min} = 3.1557\times10^{7}\,sec$

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

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

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

$0.8x = -32$

$x = -40^{\circ}$

121) $15\,L \times \frac{1.06\,qt}{1\,L} \times \frac{1\,gal}{4\,qt} \times \frac{52\,mi}{1\,gal} \times \frac{1\,Km}{0.62\,mi} = 330\,Km$

123) $1.0\times10^{-13}\,cm \times \frac{1\,m}{100\,cm} = 1.0\times10^{-15}\,m$ $52.9\,pm \times \frac{1\,m}{10^{12}\,pm} = 5.29\times10^{-11}\,m$

$\%V = \frac{4/3\,\pi r^3}{4/3\,\pi r^3} = \frac{r^3}{r^3} \times 100 = \frac{(1.0\times10^{-15}\,m)^3}{(5.29\times10^{-11}\,m)^3} \times 100 = 6.8\times10^{-13}\%$

127) $\frac{2.40\text{ g Na}}{1\text{ day}} \times \frac{100\text{ g NaCl}}{39.33\text{ g Na}} \times \frac{100\text{ g Mix}}{1.25\text{ g NaCl}} = 488\text{ g Mix/day}$

131) $1.75\text{ L}_{N_2} \times \frac{1000\text{ mL}}{1\text{ L}} \times \frac{0.808\text{ g}_{N_2\,liq}}{1\text{ mL}} \times \frac{1\text{ L}_{gas}}{1.15\text{ g}} = 1.229565 \times 10^5\text{ L } N_2\text{ gas}$

$g(liq) = g(gas)$

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

$= 2.50 \times 10^5\text{ L}$

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

137) $8\text{ hr} \times \frac{60\text{ min}}{1\text{ hr}} \times \frac{20\text{ breath}}{1\text{ min}} \times \frac{0.50\text{ L air}}{1\text{ breath}} \times \frac{15.0\text{ L CO}}{1 \times 10^6\text{ L air}} \times \frac{1.2\text{ g CO}}{1\text{ L CO}} \times \frac{1000\text{ mg CO}}{1\text{ g CO}} = 86.4\text{ mg CO}$

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