Ch. 1

2 54) gas both take shape of container

2 56) rock on top of hill has stored E ∴ PE

2 57) rock rolling is in motion ∴ KE

4 59) a) KE - biker in motion

b) PE - at rest

c) KE - He atoms moving

d) PE - in chemical bonds

2 61) heavy molecules have more KE if at same speed

$KE = \frac{1}{2} mv^2$

2 64) gas state has most K.E.

3 66) $°F = \frac{9}{5}°C + 32 = 68°F$

$K = °C + 273 = 293\ K$

3 69) 37°C

4 71) −270°C

−450°F

4 74) $H_2O_{(l)}$ – intermolecular forces pull particles together
have more KE

$H_2O_{(s)}$ – intermolecular forces hold together

4 75) $Al_{(s)}$ would sink in $Al_{(l)}$
↓
atoms more
closely packed

32

78) [3] s → l l → g s → g

81) [5] a) l → g b) l → s c) l → s d) l → g e) g → l

83) [3] g → l 100°C → 37°C

85) [3] ethanol forms H-Bonds more E needed

87) [6] a) brick 59cal

b) ethanol 170 cal largest heat capacity

c) wood 29 cal

$q = m\, s\, \Delta T$

$\Delta T \rightarrow T_f - T_i$

17

90) 2 force per unit area (collisions)

92) 4

← less air above you

← water + air pushing down

93) 4

$$160 \text{ mm Hg} \times \frac{14.7 \text{ psi}}{760 \text{ mm Hg}} = \underline{3.09} \text{ psi}$$

$$110 \text{ mm Hg} \times \frac{14.7 \text{ psi}}{760 \text{ mm Hg}} = \underline{2.13} \text{ psi}$$

95) 3

$$30 \text{ mm Hg} \times \frac{14.7 \text{ psi}}{760 \text{ mm Hg}} = \underline{.58} \text{ psi}$$

96) 4 $40.4 \text{ mm Hg} \times \frac{1 \text{ atm}}{760 \text{ mm Hg}} = .0532 \text{ atm}$

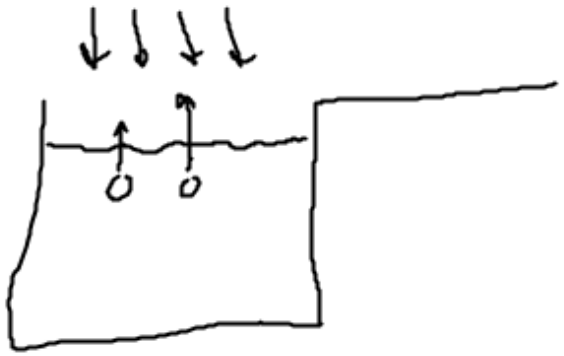
$\times \frac{101{,}300 \text{ Pa}}{760 \text{ mm Hg}} = 5380 \text{ Pa}$

97) 4 $.23 \text{ atm} \times \frac{760 \text{ mm Hg}}{1 \text{ atm}} = 175 \text{ mm Hg}$

$2.17 \text{ psi} \times \frac{760 \text{ mm Hg}}{14.7 \text{ psi}} = 112 \text{ mm Hg}$

$\frac{175}{112}$ yes Hyper

101) 3 Lower, less pressure



24

102) 3
a) to much motion / no Interactions

b) KE ↑T

c) motion

104) 2 $11.2\,L \times \frac{1\,mol}{22.4\,L} = .500\,mol$

109) 3 P at top is less than Denver

111) 2 $P_1V_1 = P_2V_2$ $V_2 = \frac{P_1V_1}{P_2} = \frac{(142.8\,atm)(2.24\,L)}{.84\,atm} = 380\,L$

113) 3 $P_1V_1 \propto P_2V_2$ $V_2 = \frac{P_1V_1}{P_2} = \frac{(1\,atm)(3.6L)}{5.9\,atm} = .61\,L$

114) 2 P decreases V increases

115) 2 P increases V decreases

117) 2 P will increase

120) 2 $\frac{P_1}{T_1} = \frac{P_2}{T_2}$ $T_2 = \frac{P_2 T_1}{P_1} = \frac{(103\ kPa)(373\ K)}{101.3\ kPa} = 379\ K$

122) 2 $P_2 = \frac{P_1 T_2}{T_1} = \frac{(1\ atm)(398\ K)}{373\ K} = 1.06\ atm$

124) 2 molecules slow down

127) 3 V increases — less dense

129) 3 $\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$ $V_2 = \frac{P_1 V_1 T_2}{T_1 P_2} = \frac{(2.7\ atm)(2.25\ L)(273\ K)}{(285\ K)\left(\frac{1000\ kPa}{101.3\ kPa}\right)} = 5.9\ L$

133) 2 $P_{TOT} = P_{Ar} + P_{Ne}$

$2.42\ atm = P_{Ar} + 1.81\ atm$ $P_{Ar} = .61\ atm$

134) 4 increases

136) 3 beach - more P

138) 2 bends, CO poisoning, diabetic wounds, infection of necrotizing fasciitis

139) 3 P↑ causes N_2 bubbles to redissolve

140) 2 hemoglobin binds O_2. O_2 diffuses out of blood slower than N_2

141) 2 CO binds to hemoglobin more than O_2

142) 2 HBOT reduces amount of time to drive out CO

145) 5
$$n = \frac{PV}{RT} = \frac{(2.5\ \text{mmHg})(5.58\ \text{L})}{\left(\frac{62.4\ \text{mmHg·L}}{\text{mol·K}}\right)(294\ \text{K})} = 7.6\times10^{-4}\ \text{mol}$$

129
4.1-4.4

56