Ch 12 Liquids, Solids, and IMFs

35 a) LD b) LD, d-d, H-bond c) LD, d-d d) LD

37 a) LD, d-d b) LD, d-d, Hbond c) LD d) LD

39 $CH_4 < CH_3CH_3 < CH_3CH_2Cl < CH_3CH_2OH$ 1st two LD only bp increase w/ MM; d-d; d-d + Hbond

40) $H_2S < H_2Se < H_2O$ 1st two LD + d-d only H_2O also H-bond

84) BP generally increases w/ MM H_2O exception → so much higher due to H-bonding (H_2O should be +100°C Not -)

★ 119 ?

41) a) CH_3OH has H-bond b) CH_3CH_2OH H-bond c) CH_3CH_3 higher mass

45) a) No P/NP b) Yes ion-dipole c) Yes LD d) Yes LD, d-d + Hbond

48) water will wet surfaces when it has strong adhesive forces (d-d) it will bead on NP surfaces (oil) only LD cohesive (H-bond) Mercury beads because it only has LD forces

50) Multigrade oils contain polymers that coil at Low T + uncoil at high T at Low T the molecules have lower LDFs at high T the molecules have higher LDFs due to long straight shape helps maintain the viscosity

51 ?

53) 12 cm dish the larger surface for molecules to evaporate from dynamic eq of evap = cond will be reached faster VP - same in both because it only depends on Temp

63) $\ln \frac{P_2}{P_1} = \frac{-\Delta H_{vap}}{R}\left(\frac{1}{T_2} - \frac{1}{T_1}\right)$ $\ln \frac{P_2}{760} = \frac{-36560\ J/mol}{8.314\ J/K\cdot mol}\left(\frac{1}{288K} - \frac{1}{351K}\right)$

$\frac{P_2}{760} = e^{-2.913}$ $P_2 = 41$ torr

64) $\ln \frac{445}{760} = \frac{-30720\ J/mol}{8.314\ J/K\cdot mol}\left(\frac{1}{T_2} - \frac{1}{353.3K}\right)$ $T_2 = 336K$ $63°C$

67) $65.8g \times \frac{1mol}{18.02g} \times \frac{-6.02KJ}{1mol} \times \frac{1000\ J}{1KJ} = -2.20 \times 10^4\ J$

22.0 KJ released

79) $8.5_g \times \frac{1\,mol}{18.02_g} \times \frac{6.0\,KJ}{1\,mol} \times \frac{1000\,J}{1\,KJ} = 2831.2\,J$ $q_{water} = -q_{ice}$

$q = mC\Delta T$ $\quad \Delta T = \frac{q}{mC} = \frac{-2831.2\,J}{225_g \times 4.18\,J/_{g \cdot °C}} = -2.7°C$

81) Water has a very high specific heat capacity which moderates climates along coasts (water can store heat)

~~117) a) p-type Ge (4A) Ga (3A) Ga will generate e' holes~~

b) n-type Si (4A) As (5A) As ~~will add~~ e^- to the conduction band

97) decreasing the pressure will decrease the temp of the liq N_2 as P↓ boiling pt ↓ as does Temp Vaporization removes heat from the liquid if P drops below the P at the triple pt it will solidify

85) $n = \frac{PV}{RT} = \frac{(23.76\,torr)(1.5L)}{\left(62.4\,\frac{L \cdot torr}{K \cdot mol}\right)(298K)} = 0.00191\,8\,mol\,gas \times \frac{18.02_g}{1\,mol}$

$= 0.034\,56_g$

$1.25_g - 0.034\,56_g = 1.22_g$ liquid