

Chapter 6 Answer Key:

6.5 True. The vapor pressure of a liquid is a measure of the escaping tendency of its molecules. Increasing the temperature increases the kinetic energy of its molecules and increases their escaping tendency.

6.6 False. The temperature of a liquid boiling in an open beaker will remain constant until all the liquid is transformed into a gas. Consequently, the vapor pressure, which is a function of temperature, must also remain constant during the transition.

6.7 Solids and liquids are virtually incompressible because the molecules are already in contact, there is no possibility of a change in volume with an increase in pressure.

6.11 True. The transformation between the solid state and the liquid state occurs at the same temperature. If the transformation is approached by raising the temperature of the solid until the liquid forms, the temperature is called the melting point. If the transformation is approached by lowering the temperature of the liquid until the solid forms, the temperature is called the freezing point.

6.13 9.7 kcal of heat will be evolved because the condensation of a gas is the reverse of vaporization.

6.17 Hydrogen bonds require that you have an H covalently bonded to an O, N or F atom. Part b is the only pair in which both compounds meet this requirement.

6.18 Hydrogen bonds require that you have an H covalently bonded to an O, N or F atom. Part c is the only pair in which both compounds meet this requirement.

6.20 Each of these molecules is non-polar and only has London dispersion forces holding the molecules together. Molecules with higher molecular weight (bigger and more electrons) have the stronger London dispersion forces. So



6.21 Why does carbon tetrachloride have no dipole moment? Because the four C-Cl bonds are arranged symmetrically (tetrahedrally) with carbon at the center of the tetrahedron. This results in the average partial negative charge being felt at the center of the tetrahedron, exactly where the partial positive charge is located. (They cancel) so there is no net dipole in the molecule.

6.22 Carbon dioxide has a linear structure. The C-O dipoles are directly opposite to each other so that the net dipole moment is zero.