

Chapter 10

8. The hot tea is at a higher temperature and when it spills onto the skin it transfers heat to the skin until they reach the same temperature.
11. The system is the part of the universe that the individual is studying. The surroundings include everything in the universe outside of the system.
13. Lower!
14. a) Endothermic (KBr as the system)
B) Exothermic (Methane is the system)
c) Exothermic (Sulfuric acid is the system)
d) Endothermic (water is the system)
65. Sublimation (answer b) is the only process that is endothermic.

Chapter 11

9. Certain salts can only emit certain wavelengths of light based on their atomic structure.
16. Discrete energy levels relates to the idea that there are only certain orbitals an electron has a probability to exist in. This is evident by the light emitted during the flame test typically being of only one color instead of all of the colors (white light).
24. Bohr's theory is limiting in that it explains the "line spectra" experiments well but it cannot explain other atomic phenomena.
26. An orbit specifically applies to a circular path (Bohr Model). Orbitals allow for electrons to occupy any space relative to the nucleus but only with a particular probability.
29. The electron in the s orbital is most likely to be found in a spherical shape around the nucleus. If you assume the earth to be spherical then the atmosphere would be a logical place to find the electron surrounding the nucleus.
47. The valence electrons are in the most outer electron "shell" and this is indicated on the periodic based on the row the electrons are occupying.
50. a) silicon b) beryllium c) neon d) argon
53. See Professor/TA for help if needed. Important topic!
56. Based on the periodic table! 2nd column, 2nd column after transition metals, 4th column after transition metals, noble gases.
61. See Professor/TA for help if needed. Important topic!
63. a) eight b) three c) five d) six

95. a) Three unpaired electrons b) one unpaired electron c) two unpaired electrons

73. Cesium! Lowest ionization energy

74. The further to the left!

Chapter 12

1. A chemical bond consists of two electrons that are shared between neighboring atoms and are bound together.

7. Electronegativity

8. A bond is polar if one end of the bond is an highly electronegative atom (pulling the electrons) and the other atom has a much lower electronegativity (not pulling as strongly). Examples include C-F, O-H

11. $H > Na > K$

13. a) covalent b) ionic c) polar covalent

19. a) Na—F b) Ca—O c) Cs—Cl d) Mg—N

25. a) C(+)-F(-) b) Si(+)-C(-) c) C(+)-O(-) d) B(+)-C(-)

33. a) Cl(-) Ar b) Sr(2+) Kr c) O(2-) Ne d) Rb(+) Kr

38. See Professor/TA if help is needed. Important topic!

43. Positive ions are smaller due to less electrons, and the remaining electrons are pulled closer to the nucleus.

44. Anions are larger due to more electrons, resulting in more repulsive forces and the electrons being further from the nucleus.

48. a) I b) F- c) F-