Ch 9 Exercises

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^5$

39a) Si: $1s^2 2s^2 2p^6 3s^2 3p^2$

41a) N: $\underset{1s}{\uparrow\downarrow}$ $\underset{2s}{\uparrow\downarrow}$ $\underset{2p}{\uparrow}$ $\uparrow$ $\uparrow$

43d) I: $[Kr]\ 5s^2 4d^{10} 5p^5$

44a) Kr (see above $4p^6$)

c) $[Kr]\ 5s^2 4d^{10} 5p^2$ = Sn

50a) Al: 3 valence e⁻; lose 3 d) Se: 6 valence e⁻, gain 2

51) reactive metal = a) ns^2 reactive nonmetal = $ns^2 np^5$

55) Be vs N Be $Z_{eff} = 4-2 = +2$ N $Z_{eff} = 7-2 = +5$

N same outer energy level → has 7 protons while Be only has 4

both have 2 core e's

61) F < S < Si < Ge < Ca < Rb F is smallest size ↓ as → table (↑ nuclear charge)

size ↑ as you ↓ table (higher energy levels = farther from nucleus

65a) V^{+5} $[Ar]$ ~~$4s^2 3d^3$~~ No unpaired e⁻ (diamagnetic)

b) Cr^{+3} $[Ar]\ 4s^1 3d^5 - 3e^- = [Ar]\ 3d^3$ 3 unpaired e⁻ (paramagnetic)

#p 8 9 10 11 12

69) $O^{-2} > F^- > Ne > Na^+ > Mg^{+2}$ ions are isoelectronic so radius depends on #protons (↑ nuclear charge)

71) a) Br b) Na 77) c) C d) F

88) Need cation similar size and charge Na^+ is too small Rb^+ is too large Ca^{+1} would be same charge but would too easily become +2 Ar^+ would have too large of 1st IE to become +1

95) (see pg 360) He and Ne have 1st IEs over 2000 KJ/mol

1st IE ↓ as you move down the group Kr, Xe, and Rn have

1351 1170 1037

similar 1st IEs to H (1312)