Chapter 4 Homework Key

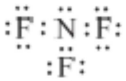
17, 23, 24, 28, 36, 40, 41, 48, 52, 55, 57, 58, 60, 64, 70, 78, 82

17. (a) S^{2-} (b) Potassium ion (c) Bromide ion
(d) F^- (e) Calcium ion (f) Fe^{3+}

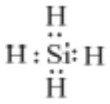
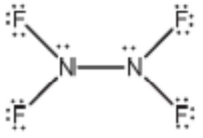
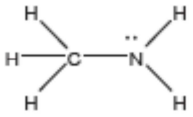
23. a. Iron(II) chloride is d. $FeCl_2$
c. Silver fluoride is h. AgF
e. Iron(III) bromide is b. $FeBr_3$
g. Sodium oxide is f. Na_2O

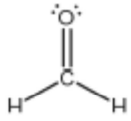
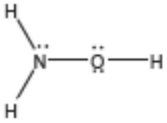
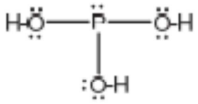
24. (a) Lithium fluoride (b) $CaCl_2$ (c) Magnesium sulfide
(d) AgI (e) Copper(II) oxide (f) Cu_2S

28. (a) KOH (b) Magnesium carbonate (c) $Fe(CN)_3$
(d) FeC_2O_4 (e) Copper(II) sulfate (f) Sodium dichromate

36.  Eight electrons around each atom

40. (a) CS_2 (b) ClF_3 (c) Phosphorus pentafluoride
(d) Carbon tetraiodide (e) C_3O_2 (f) Tetraphosphorus trisulfide

41. (a)  (b)  (c) 
Each line/bond represents two electrons.

(d)  (e)  (f) 

48. (a) Polar (b) Polar (difference = 2.0) (c) Polar

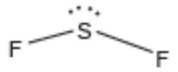
52. a. $^{\delta-}O - H^{\delta+}$
b. $^{\delta+}C - F^{\delta-}$
c. C=C, it is not polar.

55. Difference in brackets:
f. P—Cl (0.9) < b. N—F (1.0) < e. Si—Cl (1.2) < a. H—F (1.9) <
c. B—F (2.0) < d. Si—F (2.2)

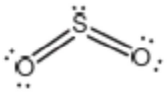
57. (a) SiH_4: tetrahedral (b) H_2Se: bent (2 LPs) (c) PH_3: trigonal pyramidal (1 LP)
(d) SiF_4: tetrahedral (e) OF_2: bent (2 LPs) (f) $H_2C=O$: trigonal planar

58. (a) $CHCl_3$: tetrahedral (b) BCl_3: trigonal planar (0 LPs) (c) CF_4: tetrahedral
(d) SF_2: bent (2 LPs) (e) NI_3: trigonal pyramidal (1 LP) (f) CCl_2F_2: tetrahedral

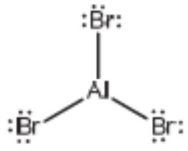
60. SF_2 is polar, the polarity of the bonds do not cancel because the lone pairs on sulfur cause the molecular shape to be bent, not linear.



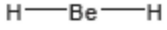
64. The lone pair on sulfur results in a bent geometry.



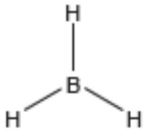
70. (a)



(b)



(c)



78. X: 7A, HX, $Na^+ \; :\ddot{X}:^-$; Y: 6A, H_2Y, $2Na^+ \; :\ddot{Y}:^{2-}$; Z: 5A, H_3Z, $3Na^+ \; :\ddot{Z}:^{3-}$

82. Na^+ is smaller than Na because it has lost its outermost electron (no shell 3 electrons), and there are now 11 protons attracting 10 electrons. Cl^- is larger than Cl because it has gained an additional electron, and there are now 17 protons attracting 18 electrons.