79. (a) covalent (b) ionic (c) ionic (d) covalent (e) ionic (f) covalent (g) covalent

80. (a) F (b) Li (c) Cl (d) Si (e) S (f) N

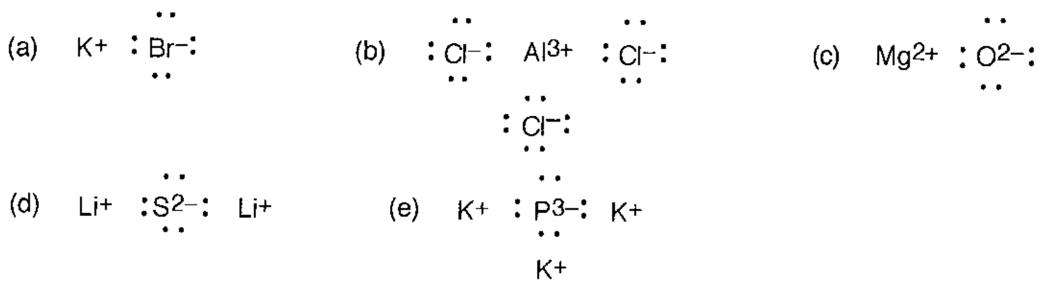
81. (a) $Na^{+}Cl^{-}$ (b) C–O (c) $Ca^{2+}O^{2-}$ (d) $Mg^{2+}O^{2-}$ (e) C–C (f) N≡N

82. ionic bonding and London forces

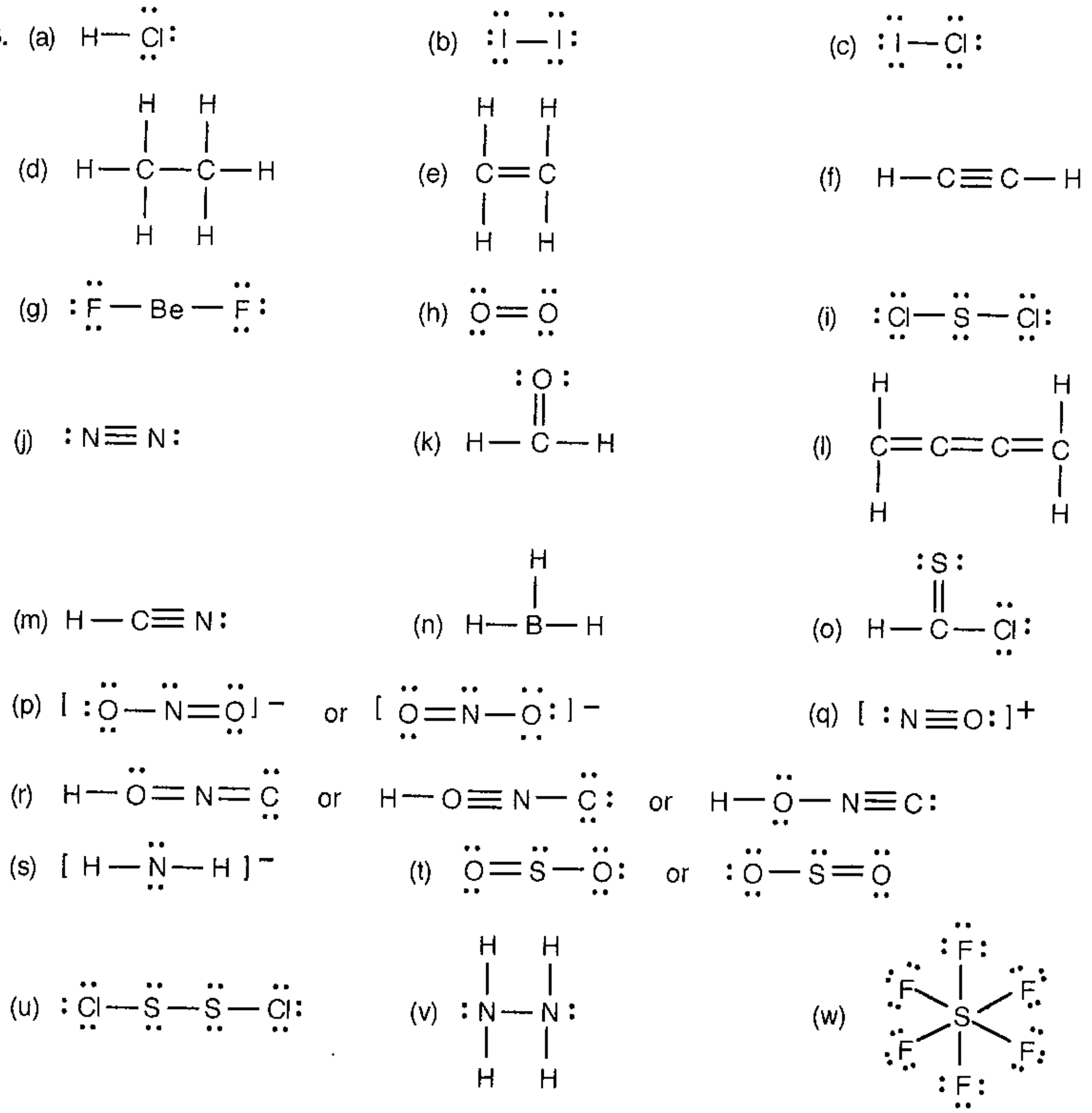
83. (a) Na^{-} (b) I (c) As^{3-} (d) Cs^{+} (e) Se^{-} (f) S^{2-} (g) Se^{2-} (h) S^{2-} (i) Cl^{-}

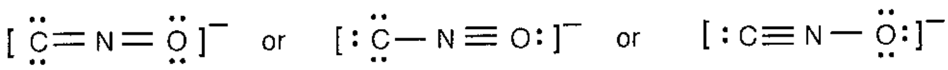
84. (a) London (b) ionic (c) London (d) covalent (e) ionic (f) London

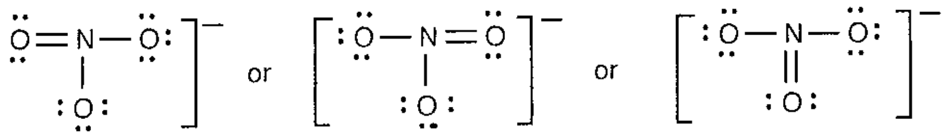
85.

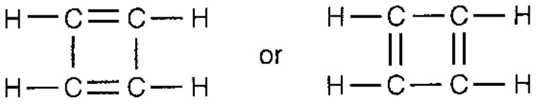


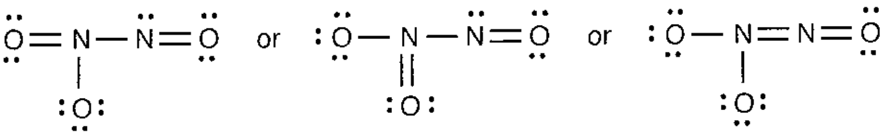
86.

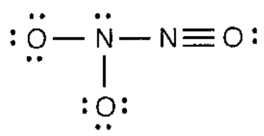


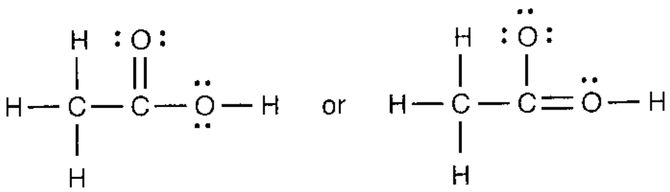
(x) 

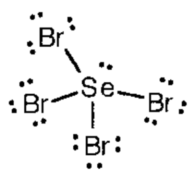
(y) 

(z) 

(aa) 

or 

(bb) 

(cc) 

87. He($1s^2$) ; Ne([He] $2s^2\ 2p^6$) ; Ar([Ne] $3s^2\ 3p^6$) ; Kr ([Ar] $4s^2\ 3d^{10}\ 4p^6$) ; Xe ([Kr] $5s^2\ 4d^{10}\ 5p^6$)

88. The full valence shells of the inert gases make them unreactive.

89. Since no other type of bond is possible, due to the full valence shells, the inert gases are held next to one another by London forces. The melting/boiling temperatures will be very low because London forces are very weak.

90. The more electrons on an atom or molecule, the greater the London forces involved. Hence, the London forces should increase going down a family in the periodic table and the melting/boiling temperatures should increase.

91. The farther down a family in the periodic table, the larger the atoms and the farther the outermost electrons are from the nucleus. As a result, the farther down the table the easier to remove an electron (the lower the ionization energy).

92. The reaction of a noble gas will involve the removal of an electron from the outer shell (since it would have no tendency to gain an extra electron), so the question is really asking about the ionization energy. As seen earlier, the lower the atom on the table the lower the ionization energy and the easier for the atom to react. Rn will be more reactive.

93. The noble gases form no naturally–occurring compounds from which they can be extracted. Also, the gases are relatively rare and do not liquify easily so the noble gases were only found when samples of air were liquified and different portions of the sample were boiled off and analyzed.

94. Li ([He] $2s^1$) ; Na ([Ne] $3s^1$) ; K ([Ar] $4s^1$) ; Rb ([Kr] $5s^1$) ; Cs ([Xe] $6s^1$) ; Fr ([Rn] $7s^1$)

95. All families show the same trend : going down the periodic table the outermost electrons are farther from the nucleus, less strongly held by electrostatic forces and easier to remove.

96. Li^+ is produced when Li reacts. The ease of removing an outer electron (tendency to react) increases going down the periodic table.