

Problem Set 2 – Chapter 7

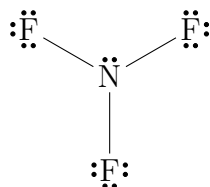
Michael Brodskiy

Instructor: Mr. Morgan

November 20, 2020

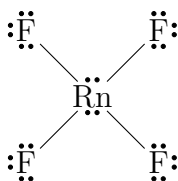
1. For the following, draw the Lewis Structure, predict the molecular structure, state bond angles, and state if the compound is polar or not.

(a) NF_3



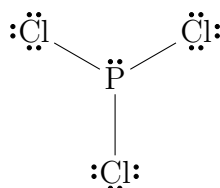
The molecular structure is most likely a Tri-pyramid; however, it follows the exception that the bond angles are 102° . The compound is polar.

(b) RnF_4



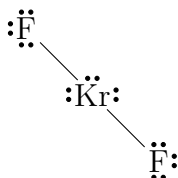
The molecular structure is most likely a square pyramid. The bond angles are 90° . The compound is polar.

(c) PCl_3



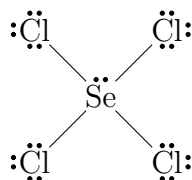
The molecular structure is most likely a Tri-pyramid; The bond angles are 109.5° . The compound is polar.

(d) KrF_2



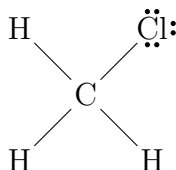
The molecular structure is most likely linear; The bond angles are 180° . The compound is non-polar.

(e) SeCl_4



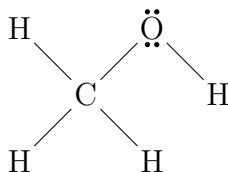
The molecular structure is most likely a Tri-bipyramid. The bond angles are 90° . The compound is non-polar.

(f) CH_3Cl



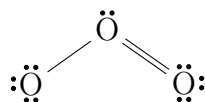
The molecular structure is most likely tetrahedral. The bond angles are 109.5° . The compound is polar.

(g) CH_3OH



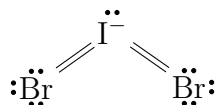
The molecular structure is most likely tetrahedral. The bond angles are 109.5° . The compound is polar.

(h) O_3^{2-}



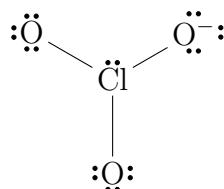
The molecular structure is most likely bent. The bond angles are 109.5° . The compound is polar.

(i) IBr_2^-



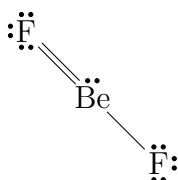
The molecular structure is most likely bent. The bond angles are 109.5° . The compound is polar.

(j) ClO_3^-



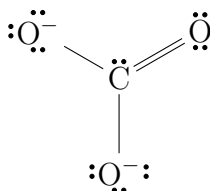
The molecular structure is most likely a Tri-pyramid. The bond angles are 109.5° . The compound is polar.

(k) BeF_2



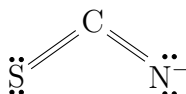
The molecular structure is most likely linear. The bond angles are 180° . The compound is non-polar.

(l) CO_3^{2-}



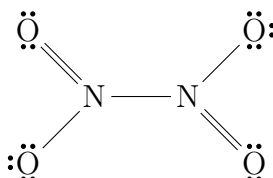
The molecular structure is most likely a Tri-pyramid. The bond angles are 109.5° . The compound is polar.

(m) CSN^-



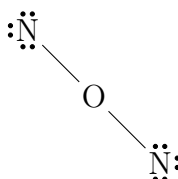
The molecular structure is most likely bent. The bond angles are 109.5° . The compound is polar.

(n) N_2O_4



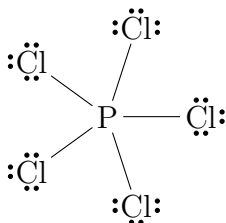
The molecular structure is most likely Triangular planar. The bond angles are 120° . The compound is non-polar.

(o) N_2O



The molecular structure is most likely linear. The bond angles are 180° . The compound is non-polar.

(p) PCl_5



The molecular structure is most likely Tri-bipyramid. The bond angles are 120° between F and P and 180° between F and F. The compound is non-polar.

2. Give the bond angles to all carbon atoms in the following molecules:

(a) CH_3CCH

- On the carbon attached to three hydrogen: 109.5°
- On the carbon bonded with the other carbons: 109.5°
- On the carbon triple bonded to another carbon and single bonded to hydrogen: 109.5°

(b) C_2H_4

- On both carbons: 120°

(c) CHOOH

- 120°

(d) $\text{CH}_3\text{CHCHCH}_3$

- On the carbons attached to three hydrogen: 109.5°
- On the carbons double bonded to each other and hydrogen: 120°