CHAPTER 8 – CHEMICAL BONDS
CHAPTER 9 MOLECULAR GEOMETRY

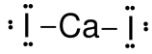
1. Arrange the following elements in order of increasing **electronegativity**: F, Cl, Se, S

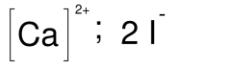
Smallest $\xrightarrow{\text{to}}$ Largest

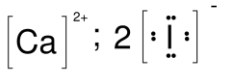
A. Se < S < Cl < F
B. F < Cl < S < Se
C. F < S < Cl < Se
D. Se < Cl < S < F
E. Se < F < Cl < S

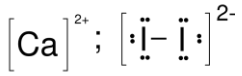
---

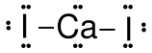
2. Which of the following best represents the Lewis dot structure of calcium iodide?

A 

B 

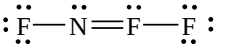
C 

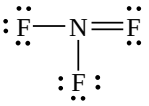
D 

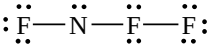
E 

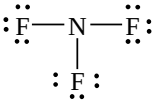
---

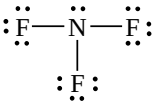
3. Which one of the following structures represents the Lewis dot structure of NF_3?

A 

B 

C 

D 

E 

---

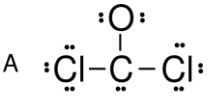
4. Which of the following are **correctly** arranged in order of **increasing polarity**?

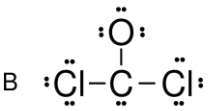
Smallest $\xrightarrow{\text{to}}$ Largest

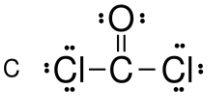
A. Si—Cl < Si—P < Si—S < Si—F
B. Si—Cl < Si—S < Si—F < Si—P
C. Si—P < Si—S < Si—Cl < Si—F
D. Si—F < Si—Cl < Si—S < Si—P
E. Si—P < Si—Cl < Si—S < Si—F

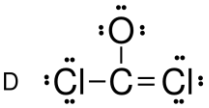
---

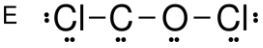
5. Which is the best Lewis structure for $COCl_2$?

A 

B 

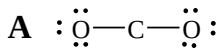
C 

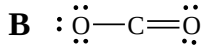
D 

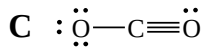
E 

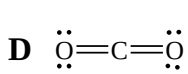
---

6. Use formal charges to decide which one of the following structures is the more stable resonance structure for the molecule CO_2.

A 

B 

C 

D 

E all are equally stable

---

7. Which ONE of the following molecules has a trigonal planar molecular geometry?

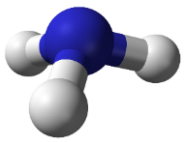
A. NF_3
B. BeF_2
C. O_3
D. BF_3
E. H_2O

---

8. What are the bond angles found around a molecule which is tetrahedral in shape?

A. 120°
B. 180°
C. 90°
D. 109.5°
E. none of the above

Directions for NEXT FIVE Questions: use the following structure to answer these questions.



9. How many electron groups are around the central atom?
A. 2
B. 3
C. 4
D. 5
E. none

10. What is the electron group shape of this structure?
A. linear
B. bent
C. trigonal planar
D. trigonal pyramidal
E. tetrahedral

11. What is the molecular shape of this structure?
A. linear
B. bent
C. trigonal planar
D. trigonal pyramidal
E. tetrahedral

12. What is the hybridization of the central atom?
A. sp
B. sp^2
C. sp^3
D. sp^3d
E. sp^3d^2

13. What is the bond angle observed in this molecule?
A. 109.5º
B. slightly less than 109.5º
C. 120º
D. slightly less than 120º
E. 180º

---

14. What is the **molecular shape** around a central atom that has two single bonds and two lone pairs connected to it?
A. linear
B. trigonal planar
C. tetrahedral
D. trigonal pyramidal
E. bent

---

15. Which of the following compounds is polar?
A. CS_2
B. SF_2
C. $BeCl_2$
D. XeF_2
E. all are nonpolar

---

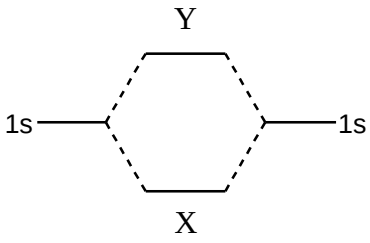
16. Which one of the following compounds has a square planar molecular shape?
A. CF_4
B. NF_4^+
C. SF_4
D. XeF_4
E. BrF_3

---

17. In valence bond theory, a double bond is composed of:
A. two sigma bonds
B. a sigma bond and a pi bond
C. two pi bonds
D. a sigma bond and a delta bond
E. a delta bond and an epsilon bond

---

18. Shown below is a molecular orbital energy-level diagram for the H_2 molecule, indicating the atomic and molecular orbitals. The atomic orbitals are named. What are the names of the molecular orbitals indicated by X and Y?



	X	Y
A.	$1s^1$	$1s^2$
B.	σ_{1s}	σ_{2s}
C.	σ_{1s}	σ_{1s}^*
D.	σ_{1s}	π_{1s}^*
E.	σ_{1s}	σ_{2s}^*
