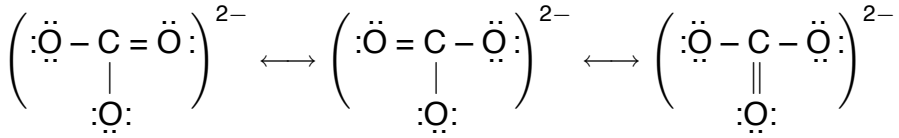
Covalent Bonding

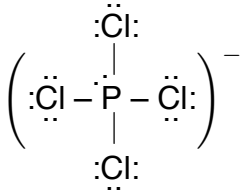
Answers

Worksheet A

A. 1. F	2. H	3. G	4. B	5. A
6. E	7. F	8. E	9. D	10. F
11. C	12. E	13. A	14. D	15. E

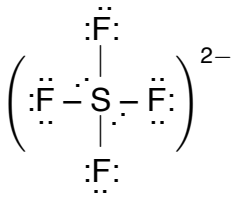
B.1. a. 

b. 120° c. trigonal planar d. sp^2 e. 0 f. 3σ, 1π

2. 

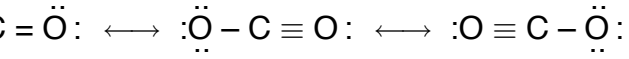
a. no resonance structures

b. 90°, 120°, 180° c. see-saw d. sp^3d e. –1 f. 4 σ

3. 

a. no resonance structures

b. 90° c. square planar d. sp^3d^2 e. –2 f. 4 σ

4. a. 

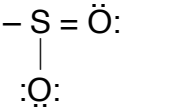
b. 180° c. linear d. sp e. 0 f. 2 σ, 2π

C. All polar except (F)

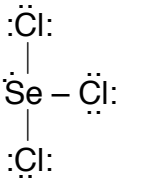
Worksheet B

A. 1. d 2. c 3. d 4. b

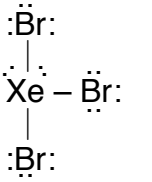
B. 1. sp^3 ; sp^2 ; sp ; sp^3 2. 109° ; 120° ; 180° ; 109°
3. 1 σ; 1 σ, 1 π ; 1 σ, 2 π

C. 1. a. 24 b.  c. 120° d. trigonal planar

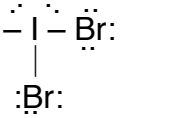
e. nonpolar f. sp^2 g. 3 σ , 1 π

2. a. 34 b.  c. 180°, 90°, 120° d. see-saw

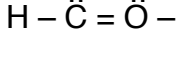
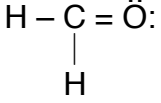
e. polar f. sp^3d g. 4 σ

3. a. 36 b.  c. 180°, 90° d. square planar

e. nonpolar f. sp^3d^2 g. 4 σ

4. a. 28 b.  c. 180°, 90° d. T–shaped

e. polar f. sp^3d g. 3 σ

D. 1.  and 

2. C_f C = –1 C_f C = 0
C_f O = +1 C_f O = 0
The second structure is the more likely structure.

Worksheet C

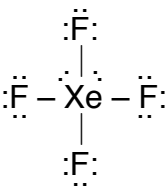
A. 1. True
2. False — decreases
3. False — C – F
4. False — CO_2 is linear, SO_2 is not.
5. False — linear, 180°
6. True
7. False — sp^3d
8. True
9. True
10. False — Most often there are four pairs.

B. 1. a. $:\ddot{O} = Si = \ddot{O}: \longleftrightarrow :\ddot{O} - Si \equiv O: \longleftrightarrow :O \equiv Si - \ddot{O}:$

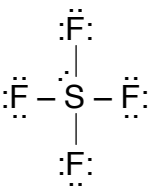
b. 180° c. nonpolar d. sp e. linear f. 2σ, 2π

2. a. $:\ddot{O} - \ddot{S} = \ddot{O}: \longleftrightarrow :\ddot{O} = \ddot{S} - \ddot{O}:$

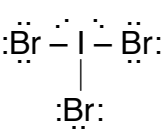
b. 120° c. polar d. sp^2 e. bent f. 2σ, 1π

3. a.  no resonance structures

b. 180°, 90° c. nonpolar d. sp^3d^2 e. square planar f. 4σ

4. a.  no resonance structures

b. 120°, 180°, 90° c. polar d. sp^3d e. see-saw f. 4σ

5. a.  no resonance structures

b. 180°, 90° c. polar d. sp^3d e. T-shaped f. 3σ

C. 1. trigonal pyramid 2. sp^3 3. – 1 4. tetrahedral
5. none 6. sp^3 7. 5 8. 109.5°
9. none 10. 9