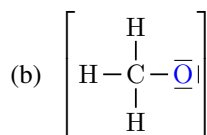
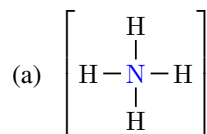


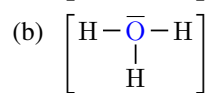
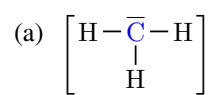
Full Name:

February 22,  
2023

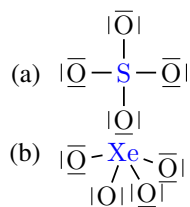
**0.1** Indicate the charge of the atom marked blue in the following electron-dot structure:



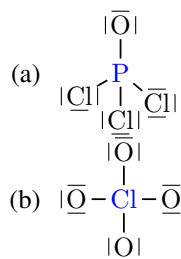
**0.2** Indicate the charge of the atom marked blue in the following electron-dot structure:



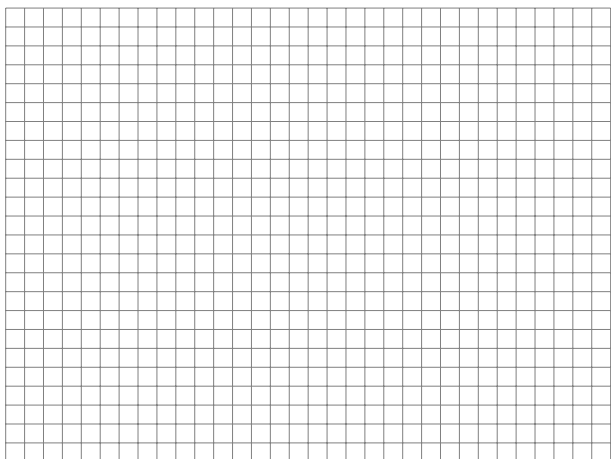
**0.3** Indicate the charge of the atom marked blue in the following electron-dot structure that follow the octet rule:



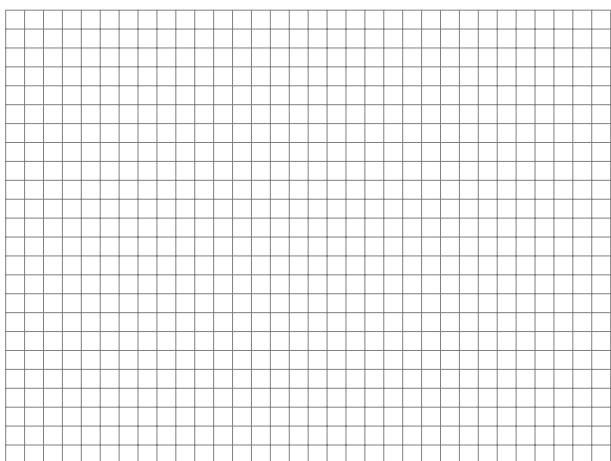
**0.4** Indicate the charge of the atom marked blue in the following electron-dot structure that follow the octet rule:



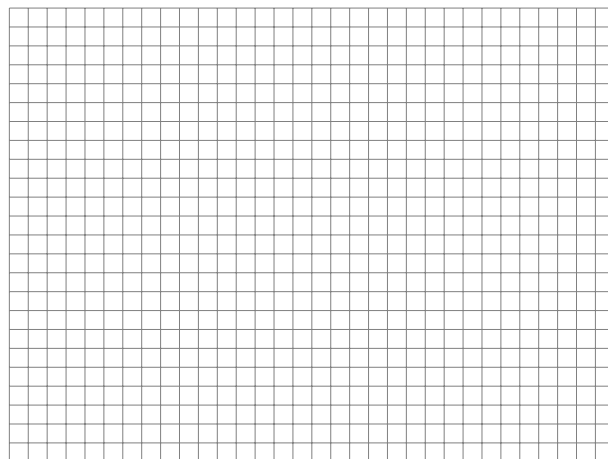
**0.5** Draw electron-dot structures for the following molecules that obey the octet rule, given that the first atom listed is the central atom: (a) HF (b) HCl



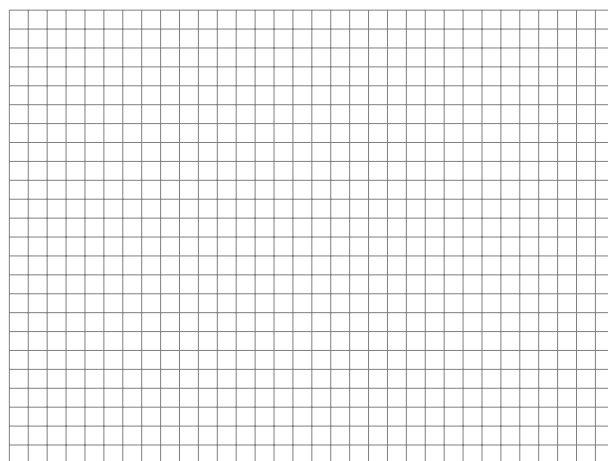
**0.6** Draw electron-dot structures for the following molecules that obey the octet rule, given that the first atom listed is the central atom: (a) F<sub>2</sub> (b) O<sub>2</sub>



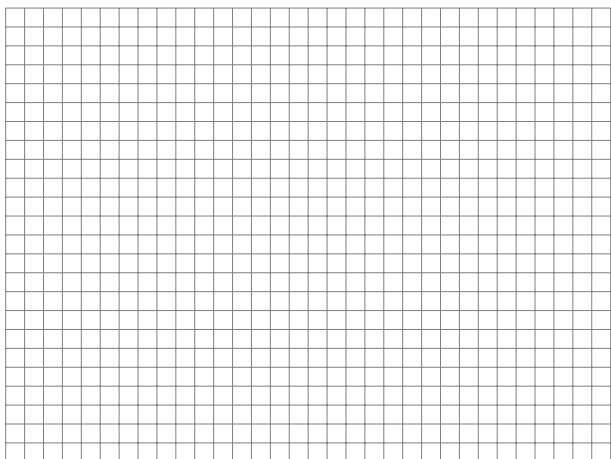
**0.7** Draw electron-dot structures for the following molecules that obey the octet rule, given that the first atom listed is the central atom: (a) CO (b) NO



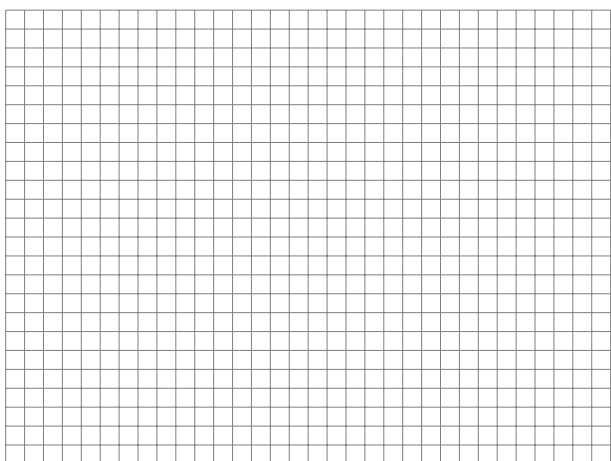
**0.8** Draw electron-dot structures for the following molecules that obey the octet rule, given that the first atom listed is the central atom: (a) ICl (b) HI



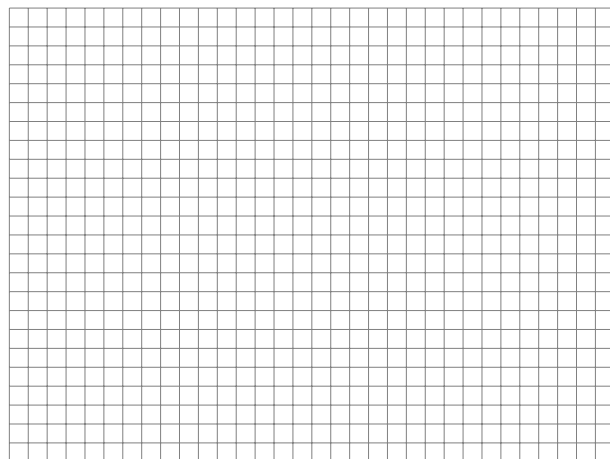
**0.9** Draw electron-dot structures for the following molecules that obey the octet rule, given that the first atom listed is the central atom: (a)  $\text{CH}_4$  (b)  $\text{CH}_3\text{Cl}$  (c)  $\text{OH}_2$



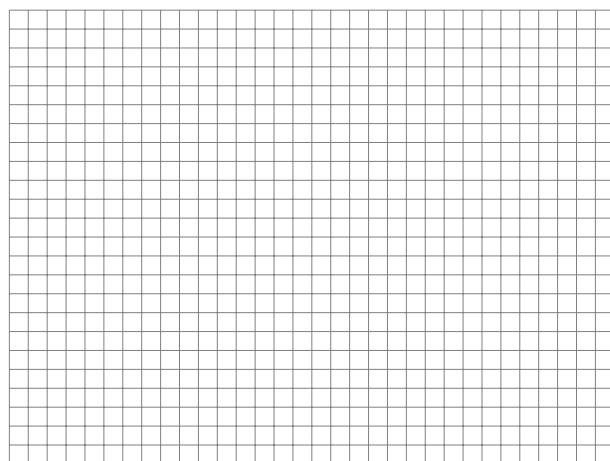
**0.10** Draw electron-dot structures for the following molecules that obey the octet rule, given that the first atom listed is the central atom: (a)  $\text{HCN}$  (b)  $\text{CO}_2$



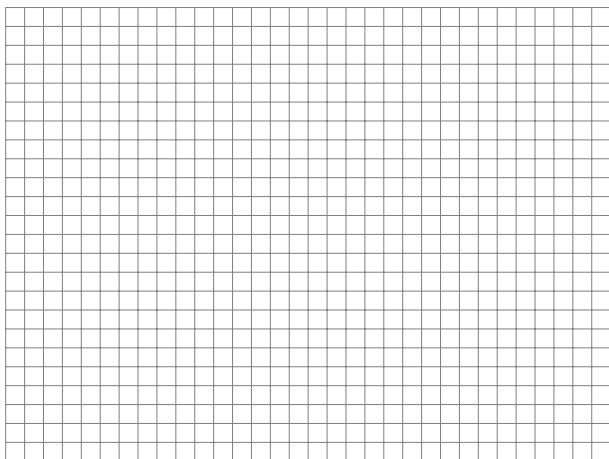
**0.11** Draw electron-dot structures for the following molecules that obey the octet rule, given that the first atom listed is the central atom: (a)  $\text{SeCl}_2$  (b)  $\text{CH}_2\text{O}$



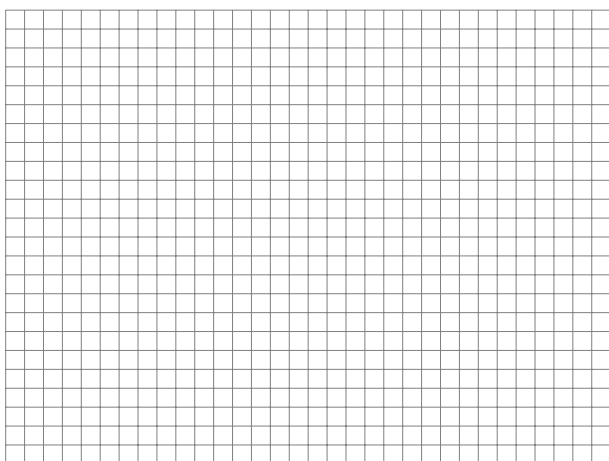
**0.12** Draw electron-dot structures for the following molecules that obey the octet rule, given that the first atom listed is the central atom: (a)  $\text{NH}_3$  (b)  $\text{NCl}_3$



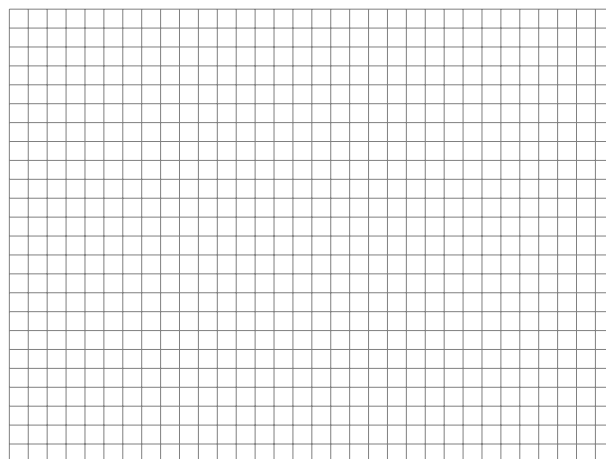
**0.13** Draw electron-dot structures for the following molecules given that the first atom listed is the central atom. Some of the atoms might not obey the octet rule. If the species has a charge indicate the location of the charge: (a)  $\text{BeH}_2$  (b)  $\text{PCl}_5$  (c)  $\text{SF}_4$  (d)  $\text{ClF}_3$



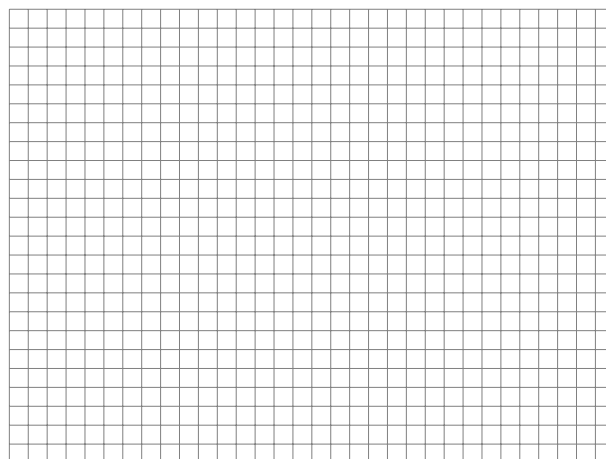
**0.14** Draw electron-dot structures for the following molecules given that the first atom listed is the central atom. Some of the atoms might not obey the octet rule. If the species has a charge indicate the location of the charge: (a)  $\text{BH}_3$  (b)  $\text{BH}_2\text{F}$  (c)  $\text{POCl}_3$  (d)  $\text{ClO}_4^-$



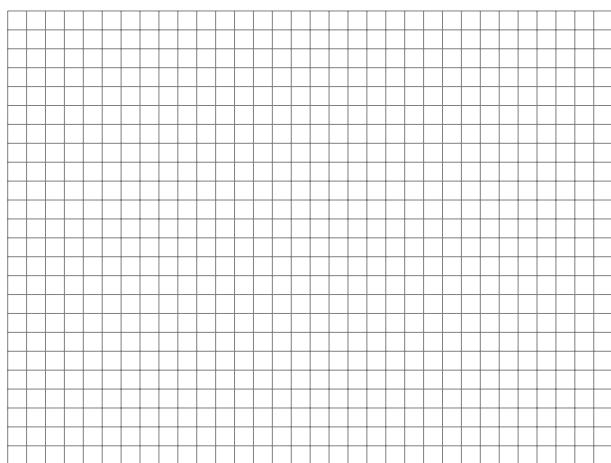
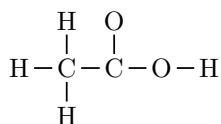
**0.15** Draw electron-dot structures for the following molecules given that the first atom listed is the central atom. Some of the atoms might not obey the octet rule. If the species has a charge indicate the location of the charge: (a)  $\text{ClF}_5$  (b)  $\text{XeF}_4$



**0.16** Draw electron-dot structures for the following molecules given that the first atom listed is the central atom. Some of the atoms might not obey the octet rule. If the species has a charge indicate the location of the charge: (a)  $\text{I}_3^-$  (b)  $\text{Br}_3^-$  (c)  $\text{SF}_6$

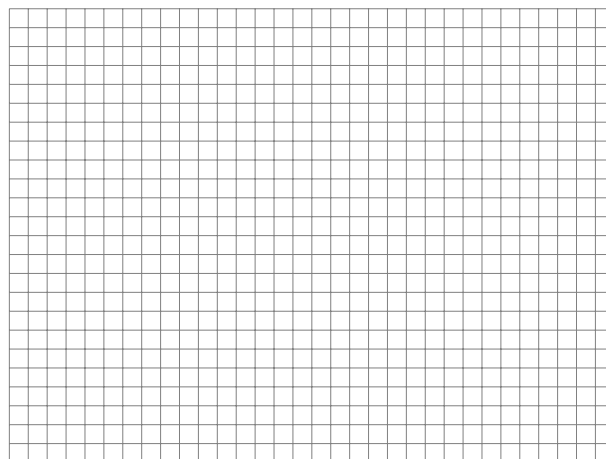
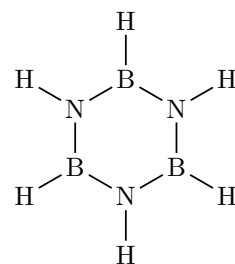


**0.17** Given the skeletal structure below, draw the lewis structure of the molecule:

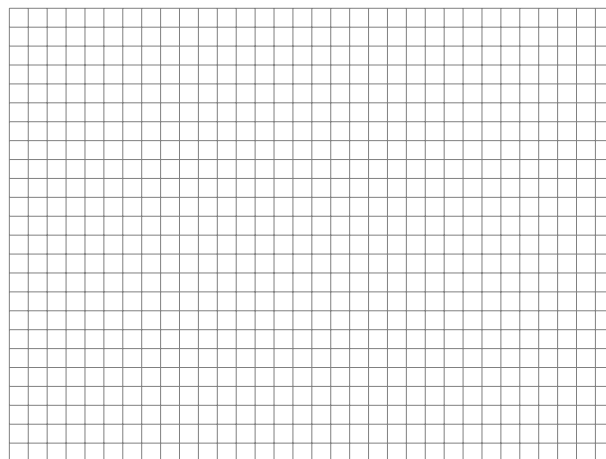
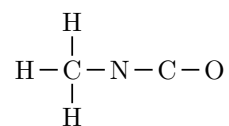


**0.18**

**0.19** Given the skeletal structure below, draw the lewis structure of the molecule:



**0.20** Given the skeletal structure below, draw the lewis structure of the molecule:

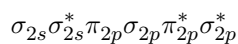




**0.21** Indicate the hybridization of: (a)  $\text{NH}_3$  (b)  $\text{CH}_4$  (c)  $\text{H}_2\text{O}$

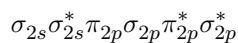
**0.22** Indicate the hybridization of: (a)  $\text{NH}_3$  (b)  $\text{CH}_4$  (c)  $\text{H}_2\text{O}$

**0.23** Using the MO order provided below



obtain the MO configuration for: (a)  $\text{O}_2$  (b)  $\text{F}_2^+$

**0.24** Using the MO order provided below



obtain the MO configuration for: (a)  $\text{B}_2$  (b)  $\text{C}_2$

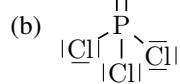
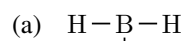
**0.25** Indicate the magnetic (paramagnetic or diamagnetic) configuration of the molecule with MO configuration:  $\sigma_{2s}^2\sigma_{2s}^{*2}\sigma_{2p}^2\pi_{2p}^4\pi_{2p}^{*2}$

**0.26** Indicate the magnetic (paramagnetic or diamagnetic) configuration of the molecule with MO configuration:  $\sigma_{2s}^2\sigma_{2s}^{*2}\sigma_{2p}^2\pi_{2p}^4\pi_{2p}^{*3}$

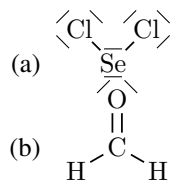
**0.27** Identify the molecular shape of the molecules: (a)  $\text{H}_2$  (b)  $\text{BeCl}_2$  (c)  $\text{BF}_3$

**0.28** Identify the molecular shape of the molecules: (a)  $\text{NH}_3$  (b)  $\text{CH}_4$

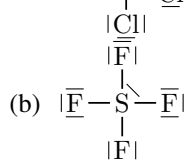
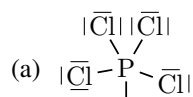
**0.29** Given the following Lewis structures, predict the molecular geometry and angles:



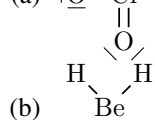
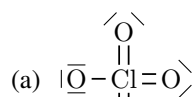
**0.30** Given the following Lewis structures, predict the molecular geometry and angles:



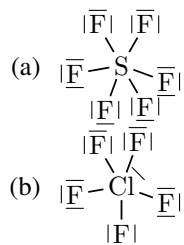
**0.31** Given the following Lewis structures, predict the molecular geometry and angles:



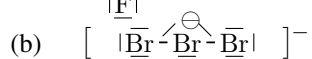
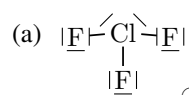
**0.32** Given the following Lewis structures, predict the molecular geometry and angles:



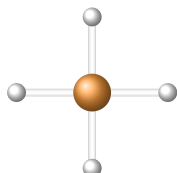
**0.33** Given the following Lewis structures, predict the molecular geometry and angles:



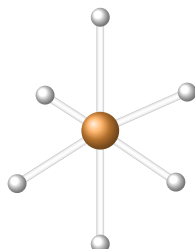
**0.34** Given the following Lewis structures, predict the molecular geometry and angles:



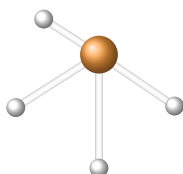
**0.35** Identify the name of the following molecular structure:



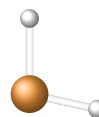
**0.36** Identify the name of the following molecular structure:



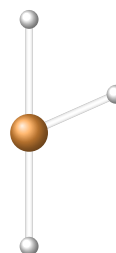
**0.37** Identify the name of the following molecular structure:



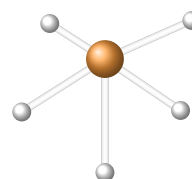
**0.38** Identify the name of the following molecular structure:



**0.39** Identify the name of the following molecular structure:



**0.40** Identify the name of the following molecular structure:





**0.41** Indicate the polarity or non-polarity for the following molecules:  
(a)  $\text{NH}_3$  (b)  $\text{CO}_2$

**0.42** Indicate the polarity or non-polarity for the following molecules:  
(a)  $\text{H}_2\text{O}$  (b)  $\text{HCl}$  (c)  $\text{H}_2$









**Answers** v. 85 **0.1** (a) +1 (b) -1 **0.2** (a) -2 (b) +1 **0.3** (a) +2 (b) +4 **0.4** (a) +1 (b) +3

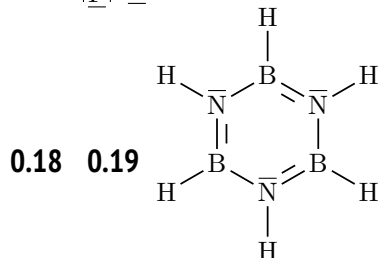
**0.5** (a)  $\text{H}-\overline{\text{F}}$  (b)  $\text{H}-\overline{\text{Cl}}$  **0.6** (a)  $\overline{\text{F}}-\overline{\text{F}}$  (b)  $\overline{\text{O}}=\overline{\text{O}}$  **0.7** (a)  $\text{C}\equiv\text{O}$  (b)  $\text{N}\equiv\text{N}$  **0.8** (a)  $\overline{\text{I}}-\overline{\text{Cl}}$  (b)  $\text{H}-\overline{\text{I}}$

**0.9** (a)  $\text{H}-\overset{\text{H}}{\underset{\text{H}}{\text{C}}}-\text{H}$  (b)  $\text{H}-\overset{\text{H}}{\underset{\text{Cl}}{\text{C}}}-\text{H}$  (c)  $\text{H}-\overset{\text{H}}{\underset{\text{O}}{\text{O}}}-\text{H}$  **0.10** (a)  $\text{H}-\text{C}\equiv\text{N}$  (b)  $\overline{\text{O}}=\text{C}=\overline{\text{O}}$  **0.11** (a)  $\overline{\text{Cl}}-\overline{\text{Se}}-\overline{\text{Cl}}$

(b)  $\text{H}-\overset{\text{O}}{\underset{\text{H}}{\text{C}}}-\text{H}$  **0.12** (a)  $\text{H}-\overline{\text{N}}-\text{H}$  (b)  $\overline{\text{Cl}}-\overline{\text{N}}-\overline{\text{Cl}}$  **0.13** (a)  $\text{H}-\text{Be}-\text{H}$  (b)  $\overline{\text{Cl}}-\overline{\text{P}}-\overline{\text{Cl}}$  (c)  $\overline{\text{F}}-\overline{\text{S}}-\overline{\text{F}}$

(d)  $\overline{\text{F}}-\overline{\text{Cl}}-\overline{\text{F}}$  **0.14** (a)  $\text{H}-\text{B}-\text{H}$  (b)  $\text{H}-\text{B}-\text{F}$  (c)  $\overline{\text{Cl}}-\overline{\text{P}}-\overline{\text{Cl}}$  (d)  $\overline{\text{O}}-\overline{\text{Cl}}=\overline{\text{O}}$  **0.15** (a)  $\overline{\text{F}}-\overline{\text{Cl}}-\overline{\text{F}}$

(b)  $\overline{\text{F}}-\overline{\text{Xe}}-\overline{\text{F}}$  **0.16** (a)  $[\overline{\text{I}}-\overline{\text{I}}-\overline{\text{I}}]^-$  (b)  $[\overline{\text{Br}}-\overline{\text{Br}}-\overline{\text{Br}}]^-$  (c)  $\overline{\text{F}}-\overline{\text{S}}-\overline{\text{F}}$  **0.17**  $\text{H}-\overset{\text{H}}{\underset{\text{H}}{\text{C}}}-\overset{\text{O}}{\underset{\text{H}}{\text{C}}}-\text{O}-\text{H}$



**0.20**  $\text{H}-\overset{\text{H}}{\underset{\text{H}}{\text{C}}}-\overline{\text{N}}=\text{C}=\overline{\text{O}}$  **0.21** (a)  $\text{NH}_3$  (  $sp^3$  ) (b)  $\text{CH}_4$  (  $sp^3$  ) (c)  $\text{H}_2\text{O}$  (  $sp^3$  )

**0.22** (a)  $\text{NH}_3$  (  $sp^3$  ) (b)  $\text{CH}_4$  (  $sp^3$  ) (c)  $\text{H}_2\text{O}$  (  $sp^3$  ) **0.23** (a)  $\text{O}_2$  (  $\sigma_{2s}^2 \sigma_{2s}^{*2} \sigma_{2p}^2 \pi_{2p}^4 \pi_{2p}^{*2}$  ) (b)  $\text{F}_2^+$  (  $\sigma_{2s}^2 \sigma_{2s}^{*2} \sigma_{2p}^2 \pi_{2p}^4 \pi_{2p}^{*3}$  )

**0.24** (a)  $\text{B}_2$  (  $\sigma_{2s}^2 \sigma_{2s}^{*2} \pi_{2p}^2$  ) (b)  $\text{C}_2$  (  $\sigma_{2s}^2 \sigma_{2s}^{*2} \pi_{2p}^4$  ) **0.25** paramagnetic **0.26** paramagnetic **0.27** (a)  $\text{H}_2$  (Linear) (b)  $\text{BeCl}_2$

(Linear) (c)  $\text{BF}_3$  (Trigonal planar) **0.28** (a)  $\text{NH}_3$  (Trigonal pyramidal) (b)  $\text{CH}_4$  (Tetrahedral) **0.29** (a)  $\text{ABE}_3$ ; planar

trigonal;  $120^\circ$  (b)  $\text{AB}_4$ ; tetrahedral;  $109.5^\circ$  **0.30** (a)  $\text{AB}_2\text{E}_2$ ; bent;  $109^\circ$  (b)  $\text{AB}_2\text{E}_2$ ; bent;  $109^\circ$   $\text{ABE}_3$ ; planar trigonal;

$120^\circ$  **0.31** (a)  $\text{AB}_5$ ; trigonal bipyramidal;  $120^\circ$  and  $90^\circ$  (b)  $\text{AB}_4\text{E}$ ; see-saw;  $120^\circ$  and  $90^\circ$  **0.32** (a)  $\text{AB}_4$ ; tetrahedral;

$109.5^\circ$  (b)  $\text{AB}_2$ ; linear;  $180^\circ$  **0.33** (a)  $\text{AB}_6$ ; octahedral;  $180^\circ$  and  $90^\circ$  (b)  $\text{AB}_5\text{E}$ ; square pyramidal;  $90^\circ$  **0.34** (a)  $\text{AB}_3\text{E}_2$ ;

T-shaped;  $180^\circ$  and  $90^\circ$  (b)  $\text{AB}_2\text{E}_3$ ; linear;  $180^\circ$  **0.35** square planar **0.36** Octahedral **0.37** see-saw **0.38** bent

**0.39** t-shaped **0.40** square pyramidal **0.41** (a)  $\text{NH}_3$  (b)  $\text{CO}_2$  **0.42** (a)  $\text{H}_2\text{O}$  (b)  $\text{HCl}$  (c)  $\text{H}_2$