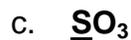


Practice Problems

2. Draw the Lewis dot structures for each of the following molecules:



3. Draw the Lewis dot structure for each of the following polyatomic ions:



4. For the following molecules or ions (where the central atom is underlined):

- Draw the Electron dot structure.
- Determine the shape of the molecule.
- Determine the approximate bond angles.



c. phosphite ion, PO_3^{-3}

5. For each of the bonds below:

- Use delta notation (δ and δ^-) to indicate which atom is more electronegative, and
- Use an arrow to point from the less electronegative atom to the more electronegative atom.

C—Cl

N—O

H—O

6. Identify the type of bond described for each of the following as ionic, polar covalent, nonpolar covalent, or metallic.

_____ i. The C—O bonds in CO_2 .

_____ iv. The C—C bonds in C_3H_8

_____ ii. The bonds in F_2 .

_____ v. The bonds in Ba.

_____ iii. The bonds in K_2O .

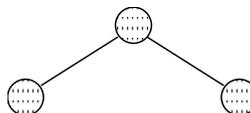
_____ vi. The bonds in H_2O .

7. Determine whether the following five molecules are polar or nonpolar:

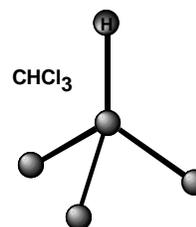
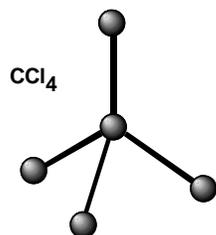
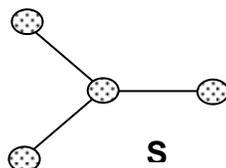
CO_2 :



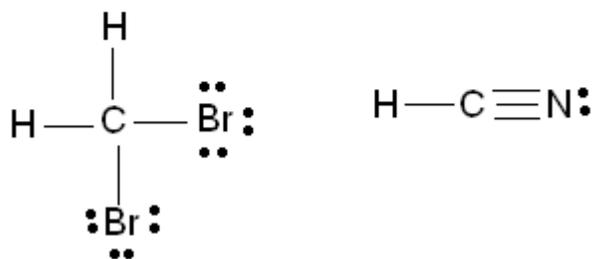
H_2O :



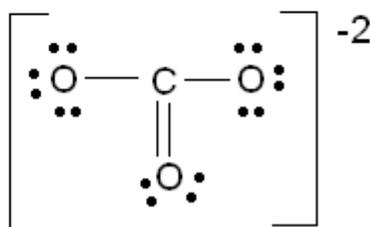
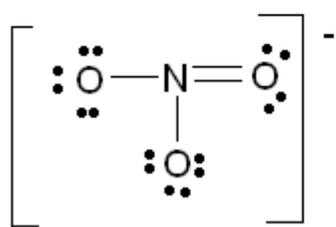
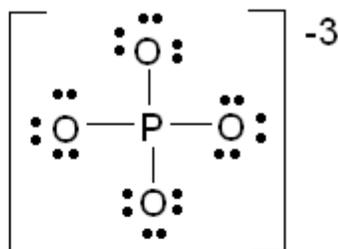
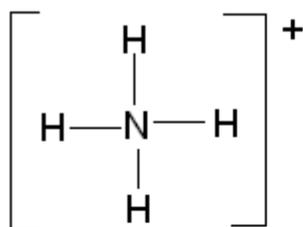
SO_3



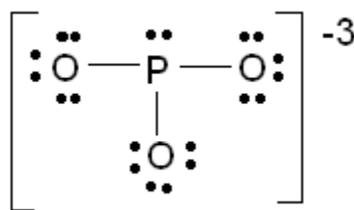
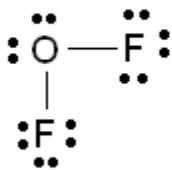
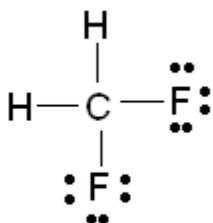
Answers



2.



3.



4.

AB_4 , tetrahedral, 109.5°

AB_2E_2 , bent, $<109.5^\circ$

AB_3E , trigonal pyramid, $<109.5^\circ$



6. polar covalent i. The C–O bonds in CO₂. nonpolar covalent iv. The C–C bonds in C₃H₈
 nonpolar covalent ii. The bonds in F₂. metallic v. The bonds in Ba.
 ionic iii. The bonds in K₂O. polar covalent vi. The bonds in H₂O.

7. CO₂ is nonpolar because the two polar bonds are equal and opposite so cancel out

H₂O is polar because the bonds are not opposite and don't cancel out

SO₃ is nonpolar because the bonds are all the same and cancel out, the outer atoms all the same

CCl₄ is nonpolar because the bonds are all the same and cancel out, the outer atoms all the same

CHCl₃ is polar because the bonds are not the same and don't cancel out, the outer atoms are different