

# Bonding Unit Review

Name: KEY

1. What is a covalent bond? What is an ionic bond?

- covalent bond involves the sharing of electrons
- ionic bond involves the transfer of electrons

2. Why do atoms bond together to form molecules?

to get full electron shells and be stable like a noble gas

3. Define electronegativity.

the ability to attract and/or gain electrons

4. What are the three types of intramolecular bonds? How do they differ?

ionic = complete transfer of electrons  
polar covalent = unequal sharing of electrons  
non-polar covalent = equal sharing of electrons

5. Identify the kind of intramolecular bonding contained in each of the following:

HI,	F <sub>2</sub> ,	MgO,	O <sub>2</sub> ,	AsH <sub>3</sub> ,	PCl <sub>3</sub>
polar	non-polar	ionic	non-polar	non-polar	polar

6. What are the three types of intermolecular bonding from strongest to weakest.

hydrogen bonding, dipole-dipole forces, dispersion forces

7. Identify the kind of intermolecular bonding in each:

HI,	F <sub>2</sub> ,	MgO,	O <sub>2</sub> ,	AsH <sub>3</sub> ,	PCl <sub>3</sub> ,	H <sub>2</sub> O
dipole-dipole	dispersion	ionic	dispersion	dispersion	dipole-dipole	hydrogen bonding

8. What is a double bond?

sharing of 4 electrons

9. How does the distance between atoms change if a single, double or triple bond is present?

What bonds are the strongest?

triple: shortest + strongest  
single: longest and weakest

10. What is the general trend in electronegativity as you go from left to right across the periods and bottom to top of the periodic table.

left to right: increase  
bottom to top: increase

11. By looking only at the periodic table, arrange the following sets in order of increasing electronegativity:

a) O, P, S

P, S, O

b) Mg, Al, Si

Mg, Al, Si

c) C, Si, N

Si, C, N

12. Arrange the bonds in each of the following sets in order of increasing polarity:

a) H-F, O-F, B-F

B-F, H-F, O-F

b) N-N, N-P, N-O

N-N, N-O, N-P

13. Draw the Lewis dot diagram for selenium with the correct number of valence electrons.

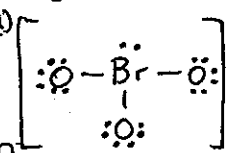


14. How many electrons must sulfur gain in order to get a stable octet?

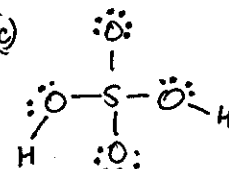
two

15. Draw Lewis diagrams for each of the following.

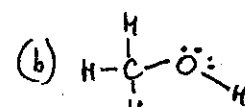
a)  $\text{BrO}_3^-$



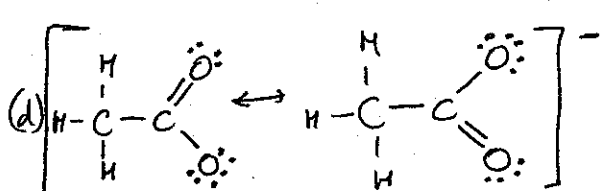
b)  $\text{CH}_3\text{OH}$



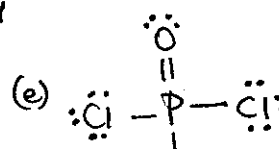
c)  $\text{H}_2\text{SO}_4$



d)  $\text{CH}_3\text{COO}^-$

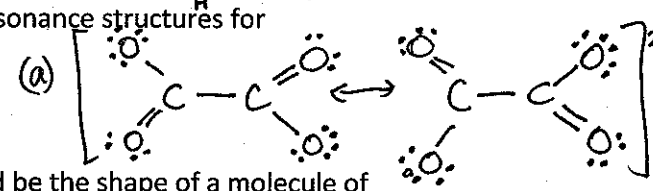


e)  $\text{OPCl}_3$

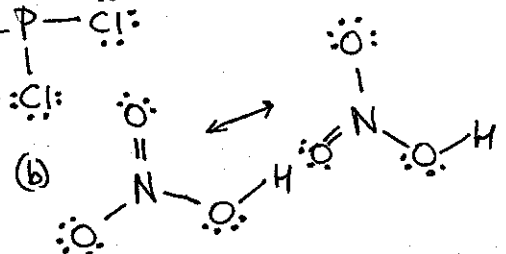


16. Draw the resonance structures for

a)  $\text{C}_2\text{O}_4^{2-}$



b)  $\text{HNO}_3$



17. What would be the shape of a molecule of

a)  $\text{CO}_2$  linear

b)  $\text{H}_2\text{S}$  bent

c)  $\text{NH}_3$  trigonal pyramidal

18. Would a molecule of  $\text{CH}_3\text{Br}$  be polar or nonpolar? What about the polarity of the molecules in #17?

polar

a) non-polar (b) polar (c) polar

19. Explain why water would have a higher boiling point than  $\text{H}_2\text{S}$ .

intermolecular bonding in water is hydrogen bonds, stronger than the dipole-dipole forces in  $\text{H}_2\text{S}$ .  $\text{H}_2\text{O}$  molecules take more energy to separate

20. Which would have the shorter bond length, H and S in  $\text{H}_2\text{S}$  or C and N in  $\text{HCN}$ ?

C and N in  $\text{HCN}$  as it's a triple bond