

1) **Know what the electronegativity of an element means when it is bonded.**

Electronegativity is a measure of the tendency of an atom to attract a bonding pair of electrons. Fluorine has the greatest electronegativity on the periodic table.

The atom with the greatest electronegativity pulls harder on the electrons in the bond producing a negative charge around it and a positive charge around the other element.

- In a covalent bond with carbon and oxygen which element will pull harder on the electrons?
- Why do covalent bonds share electrons and ionic bonds do not?
- Why do nonpolar bonds share electrons equally?

2) **Know how to find the difference in electronegativity of a compound.**

Each element has its own electronegativity and if you subtract one element in the bond from the other you get the difference which is always a positive number.

Using the electronegativities on your periodic table to do the following:

- What is the electronegativity difference in a bond of carbon and hydrogen?
- What is the electronegativity difference of a diatomic element?
- Which bond has the greatest electronegativity difference?

C-O N-H Cl-Br C-F

3) **Know how to use the difference in electronegativity to tell if a bond is ionic, polar covalent or nonpolar covalent.**

Ionic bonds have Electronegativity difference of 1.8 and greater

Polar covalent bonds have Electronegativity difference of 0.3-1.7

Non-Polar Covalent bonds have Electronegativity difference of 0.0-0.2

- What type of bond is MgBr_2 ?
- What type of bond is CH_4 ?
- What type of bond is O_2 ?

4) **Know how to tell the difference between covalent and ionic bonds.**

Covalent bonds are nonmetals bond to nonmetals which can be found on the right side of the staircase on the periodic table and have Electronegativity difference of 0.0-1.7

Ionic bonds are metals found on the left side of the staircase on the periodic table bond to nonmetals and have an Electronegativity difference above 1.8.

- Which elements below are ionic?
CO₂ CS₂ NO₂ CaS₂
- Which elements below are covalent?
KCl MgO Na₂O NH₃
- Give an example of a covalent and ionic bond not above.

5) **Know how to draw a Lewis structure.**

- Draw the Lewis structure for NO_3^- .
- Draw the Lewis structure for CH_4 .
- Draw the Lewis structure for SF_6 .

6) **Know the difference between a nonpolar covalent bond, polar covalent bond and ionic bond.**

- How can you figure out if a compound has a nonpolar covalent bond, polar covalent bond or ionic bond?
- Give examples of each type of bond.

7) **Know what type of bond is the best for conductivity of electricity and why.**

Metallic bonded compounds are good at conducting electricity because the electrons are free to move in a sea of electrons. This allows the charged electrons to flow easily in a current.

- Give an example of a metallically bonded structure.
- What happens when you run a current through a metal compound?
- Why do most covalent bonded compounds not produce conductivity?

8) Know what types of elements are in an ionic bond.

Metals on the left side of the staircase and nonmetals on the right side of the staircase.

- a. Give three examples of ionic bonds.

9) Know what types of elements are in a covalent bond.

Nonmetals bond to nonmetals found on the right side of the staircase on the periodic table.

- a. Give three examples of covalent bonds.

10) Know what types of elements are in a metallic bond.

Metals bond to metals with a sea of electrons.

- a. Give three examples of metallic bonds.

11) Know how the valence electrons act in an ionic bond, polar covalent bond, or nonpolar covalent bond.

Ionic bonds the metal element loses its valence electrons and becomes positive and the nonmetal elements gain valence electrons and become negative.

Polar covalent bonded valence electrons are shared unequally in the bond. This means that one element has a greater electronegativity and pulls the electrons closer causing a negative pole around the element and a positive pole around the other bonded element

Nonpolar covalent bonded valence electrons are shared equally in the bond. This means that both elements pull on the electrons equally and neither element produces a negative pole.

- a. Why does Na become positive when it bonds with oxygen?
b. Why is H₂O a polar molecule and CO₂ is not?
c. Why does a diatom not produce a polar molecule?

12) Know how to count the number of electrons in a bond and around an atom in a bond.

Each dot is one electron and each bond holds two electrons

- a. How many valence electrons are in CO₂
b. How many valence electrons are in H₂O
c. How many valence electrons are in NO₃⁻

13) Know that covalent bonds have a lower melting point than ionic bonds as seen in your lab.

- a. Which element below will have a lower melting?

CO₂ Na₂O MgS CaCl₂

14) Know how to name covalent bonded molecules and ionic bonded molecules.

For covalent bonds use the prefixes such as mono, di, tri name the first as it is on the periodic table using the prefixes as needed and the second element drop the ine and add an ide.

For ionic bonds name the first as it is on the periodic table and the second element drop the ine and add an ide.

- a. Name Na₂O
b. Name CH₄
c. Name C₂H₆

15) Know what a binary molecule is.

Compound with two elements.

- a. Give an example of three binary compounds.
b. Give an example of two covalent binary compounds.
c. Give an example of two ionic binary compounds.

16) Know the properties of nonpolar covalent bonds, polar covalent bonds, metallic bonds and ionic bonds

Use notes and book to study.

- a. What are the properties of each bond named above?

17) Know how to find the valence electrons in an atom.

Group 1 has one, Group 2 has two, Group 13 has three, Group 14 has four, Group 15 has five, Group 16 has six, Group 17 has seven, Group 18 has eight.

- a. How many valence electrons in the elements below?

Al Rb Mg C P Ne Se Br