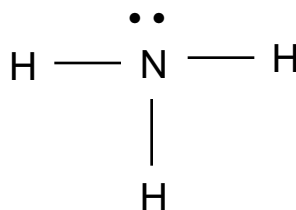


Determining whether a molecule is polar

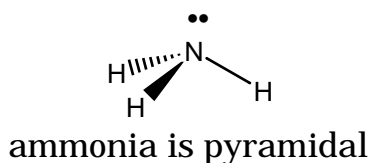
1. Determine the Lewis Structure of the molecule.
2. Use VSEPR to predict the shape of the molecule.
3. Find polar bonds
 - a. Determine the actual or relative the electronegativities of each atom involved in the bond.
 - b. Determine in which direction the bond is polarized.
Remember the more electronegative element draws the shared electrons closer to itself; it has a stronger attraction for the electrons.
By placing the electrons closer to the more electronegative element there is more negative charge at one end of the bond. The bond is polarized, which means that it is slightly positive at one end and slightly negative at the other end.
These statements mean the same thing
 - It is a *polar* bond
 - The bond has a *dipole* or *dipole moment*.
 - The bond is *polarized*.
4. Determine the dipole that results when all the dipoles in the molecule are added together.

Do ammonia, NH_3

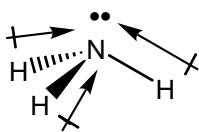
1. Determine Lewis Structure



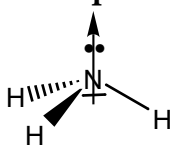
2. Use VESPR to determine shape



3. Electronegativity of N = 3.0, H = 2.1, so electrons in each bond are closer to the N than the H.



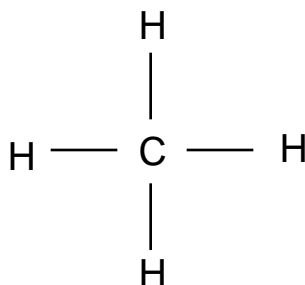
4. Determine the resultant dipole.



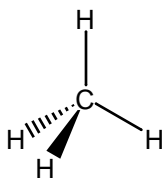
Ammonia is polar, the N is the negative end, and the middle of the H's is the positive end.

How about CH_2Cl_2

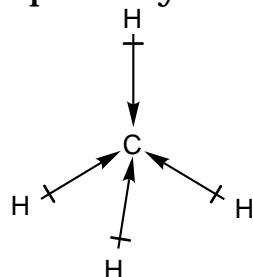
1. Determine Lewis Structure



2. Use VSEPR to determine shape



3. Determine the bond polarity



4. The dipoles cancel out. No dipole moment.