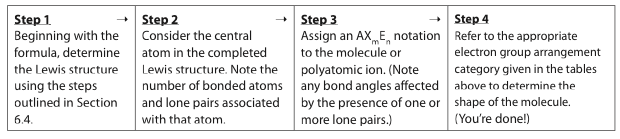
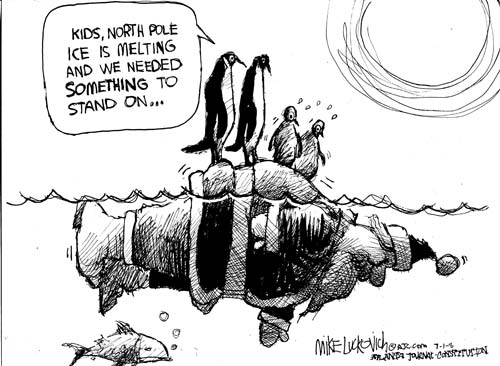
***Shapes and Behaviour of Molecules 3D***

In order to understand the shapes the molecules form we must adhere to the same rules we have been following throughout this section

1. Electrons all have the same negative charge
2. Like charges repel
3. Bonded pairs surrounding the nucleus repel other bonded pairs and other electrons
4. Lone pairs surrounding the nucleus repel other bonded pairs and other electrons
5. Valence electrons are oriented in such a way as to be as far from each other as possible

|  |  |  |  |
| --- | --- | --- | --- |
| **Molecule** | **Shape** | **Molecular Geometry** | **Reason for Shape** |
| BeCl2  (AX2) |  |  |  |
| BF3  (AX3)  (AX3E2) |  |  |  |
| CH4  (AX4) |  |  |  |
| NH3  (AX3E) |  |  |  |
| H2O  (AX2E2) |  |  |  |
| PCl5  (AX5)  ( |  |  |  |
| SF6  (AX6) |  |  |  |
| XeF4  (AX4E2) |  |  |  |



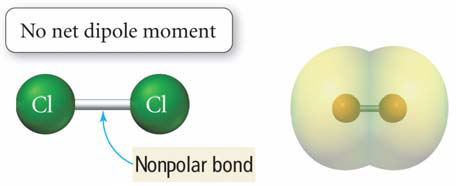
**Polar vs. Non-Polar**

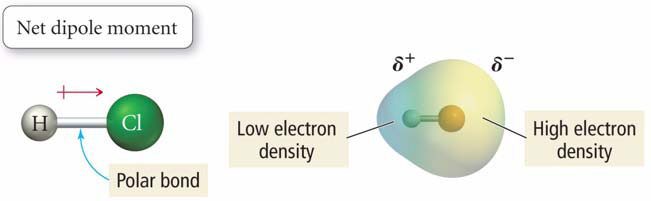
Molecules are said to be polar is the electron density is ***NOT*** evenly spread around the molecule

This causes part of the molecule to be partially positive and part of the molecule to be partially negative

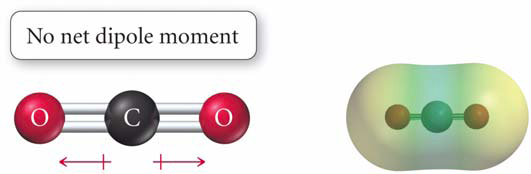
Two factors determine if a molecule is polar

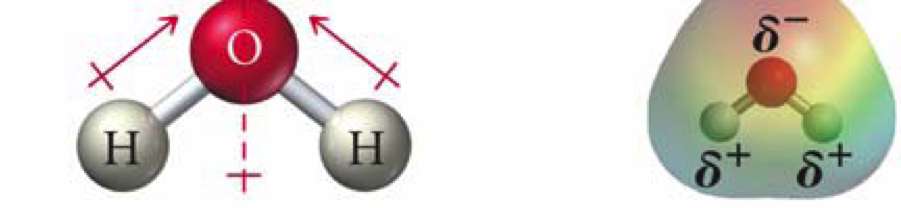
1. **Electronegativity**
2. **Symmetry of the Molecule**





In molecules with more than one bond, *the shape* ***and*** *the polarity of the bonds determine whether the molecule is polar*.

Polar or not polar? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



Polar or not polar? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The extent of polarity depends of the size of the dipole. The dipole depends on the difference in electronegativities and the symmetry of the molecule.

**Polarity Practice Worksheet**

For each of the following pairs of compounds, determine which is most polar based on their Lewis structures.

1) methyl chloride (CHCl3) or methyl bromide (CHBr3)

2) water or hydrogen sulfide (H2S)

3) hydrochloric acid (HCl) or hydroiodic acid (HI)

4) bromoacetylene (C2HBr) or chloroacetylene (C2HCl)