

# Notes: Polar and Non-Polar Molecules

**Non-polar Molecules** - Covalent compounds with non-polar bonds between the atoms inside the molecule

**Polar molecules** – Covalent compounds with polar bonds between atoms inside the molecules.

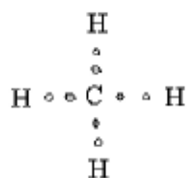
## Two shapes of bonds

Symmetrical (*Non-Polar*) - Have identical parts on each side of an axis

Asymmetrical (*Polar*) – lack identical parts on each side of an axis

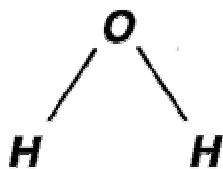
## Four Types of Bonds to Know for the Regents Examination

### **Tetrahedral** (*Non-Polar*)



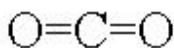
Methane gas ( $\text{CH}_4$ ) is an example of a non-polar molecule. Each bond between C and H are polar, but since the shape is symmetrical (balanced) the *entire* molecule is non-polar.

### **Angular/Bent** (*Polar*)

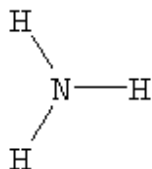


An example of an angular bond is water ( $\text{H}_2\text{O}$ ). Notice how the two hydrogen atoms are both on the bottom. This makes an off balance molecule, thus, polar.

\*There is an exception. Carbon Dioxide ( $\text{CO}_2$ ) has three atoms but is not angular. Instead it is linear.



### **Trigonal (Pyramid)** (*Polar*)



An example of a trigonal bond is  $\text{NH}_3$ . This molecule is off balance and is polar.

### **Linear Bond** (*Polar or Non-Polar*)



Oxygen ( $\text{O}_2$ ) is a non-polar linear molecule because it shares the same electronegativity



Carbon Monoxide ( $\text{CO}$ ) is a polar linear molecule. Carbon and oxygen's electronegativity differ.