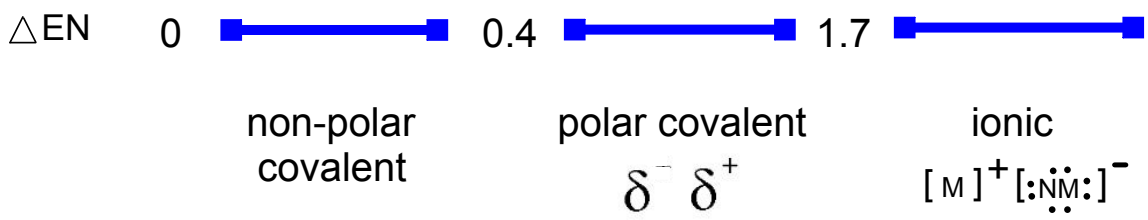
POLAR COVALENT BONDS & POLAR MOLECULES



Eg. H Cl

Eg. H C

Eg. Fe F

Molecular Models

Lewis diagrams → H O H

lone pair (belong solely to one atom)

bonding pair (shared between atoms)

Structural diagrams → H — O — H → H — O — H

bonding pair

lone pair

MOLECULAR SHAPES & BOND ANGLES

(for covalent molecules with a central atom)

For each molecule,

- draw the 2-dimensional structural diagram.
- redraw the molecule as a 3-dimensional structure.
- name the shape and indicate the bond angles.

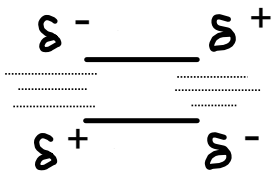
1. CH_4 **2. NH_3** **3. H_2O**

4. CO_2 **5. CSFH**

Non-Polar bonds	Polar bonds
△EN < 0.4	△EN > 0.4
C - H	O - N
N - Cl	N - H
O - Cl	O - C
	Cl - C

δ^- δ^+

Polar molecules tend to stick to each other due to **intermolecular forces** (ie. attraction between molecules) and the **dipoles** that are present.



Therefore, more NRG needed to break attractions

- this leads to higher mp and bp.

POLAR VS NON-POLAR MOLECULES

A molecule with **POLAR bonds** does **not** necessarily lead to a **POLAR molecule**!

Polar Bonds	***Non Polar Bonds***
1. H_2O	**2. OCl_2**
3. CO_2	**4. C_2H_4**
5. NH_3	**6. NCl_3**
7. CCl_4	**8. CH_4**
9. CH_2Cl_2	**10. C_3H_6**