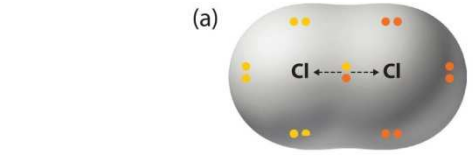
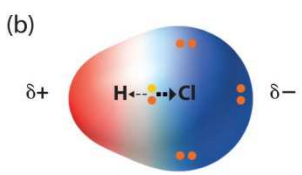
TYPES OF BONDS

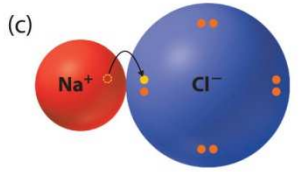
	Ionic	Polar Covalent	Nonpolar Covalent
Types of elements	Metal + nonmetal	Two different nonmetals	Two identical nonmetals
Electronegativity difference	Greater than 1.7	Greater than 0 but less than 1.7	Equal to 0
What happens to electrons	Transferred from the metal to the nonmetal	Shared unequally between the atoms	Shared equally between the atoms
How do you indicate what has occurred?	Formation of a cation and an anion	Indicate unequal sharing with partial charges δ- = higher Eneg δ+ = lower Eneg	No charges or partial charges required



Nonpolar covalent bond
Bonding electrons shared equally between two atoms.
No charges on atoms.



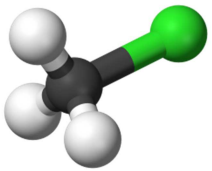
Polar covalent bond
Bonding electrons shared unequally between two atoms.
Partial charges on atoms.



Ionic bond
Complete transfer of one or more valence electrons.
Full charges on resulting ions.

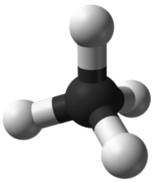
TYPES OF MOLECULES

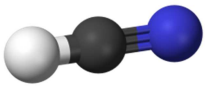
Polar Molecule	Nonpolar Molecule
Occurs when there is an asymmetrical distribution of charge Bent (ex. H_2O) and pyramidal (ex. NH_3) shapes are always polar Tetrahedral and linear molecules may be polar if the charges are not symmetrical about the central atom	Occurs when the bond is nonpolar OR When the polar bonds are symmetrically distributed around the central atom in a tetrahedral or linear molecule



CH_3Cl is a tetrahedral molecule. The bonds between C-H and C-Cl are all polar. However, the C-Cl bond is more polar and therefore there is an unequal distribution of charge.

CH_4 is a tetrahedral molecule. The bonds between C-H are all polar. These polar bonds are symmetrically distributed around the central carbon and the molecule is nonpolar.





HCN is a linear molecule. The bonds between C-H and C-N are both polar. However, nitrogen has a higher electronegativity and the C-N bond is more polar and therefore there is an asymmetrical distribution of charge

CO_2 is a linear molecule. The bonds between C-O are polar. These polar bonds are symmetrically distributed around the central atom and the molecule is nonpolar (NO POLES.)