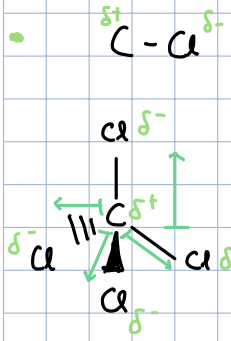
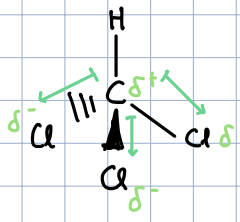


arrows represent dipole moments



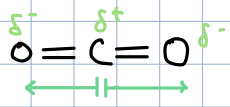
net dipole moment

Non-polar

The dipole moments are all of the same size (all bonds are the same) and they are arranged symmetrically around the molecule, since it is symmetrical and hence they cancel each other out.

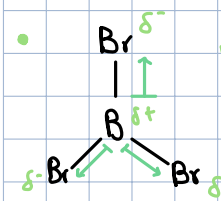
Polar

It is polar because it has a net dipole moment. Even though all of the dipole moments are of the same size, they are not arranged symmetrically and hence they do not cancel each other out.

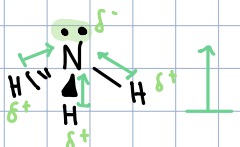


linear

non-polar

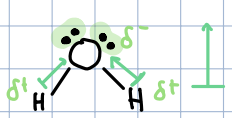


non-polar: molecule is symmetrical (all angles of 120°)



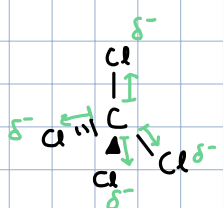
*presence of lone pair breaks the symmetrical shape of molecule

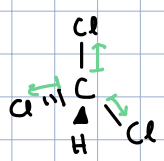
polar: bonds are not arranged symmetrically arranged the molecule



*presence of lone pair breaks the symmetrical shape of molecule

polar: bonds are not arranged symmetrically arranged the molecule





non polar:

molecule is symmetrical and all dipole moments are the same

polar:

presence of hydrogen breaks the symmetrical arrangment, so dipole moments don't cancel each other out