

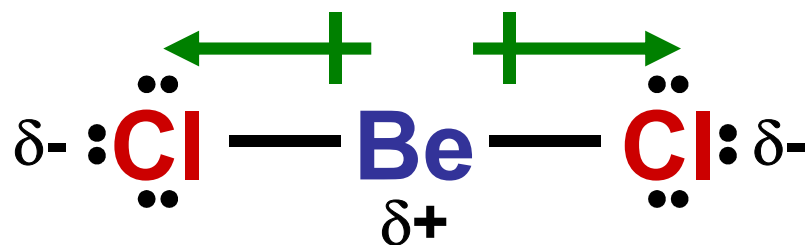
Molecular Polarity: Geometry



$$E_n = 1.5$$

$$E_n = 3.0$$

$\Delta E_n = 1.5 \Rightarrow$ Polar Covalent Bond



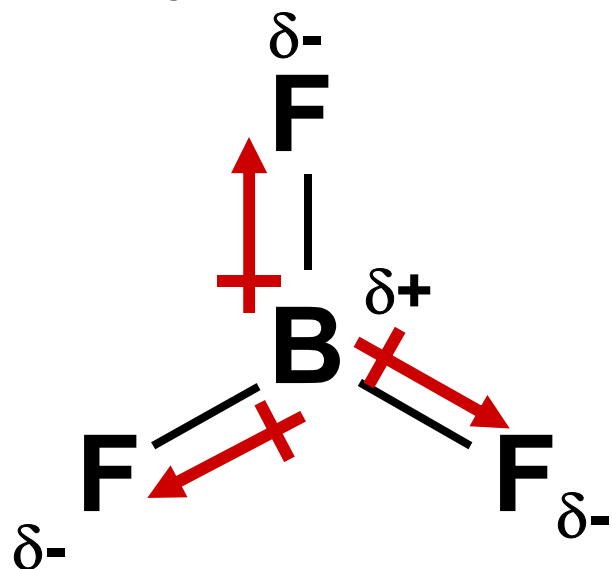
No δ^+ or δ^- ends! (middles don't count)

Dipole moments cancel out: = 0

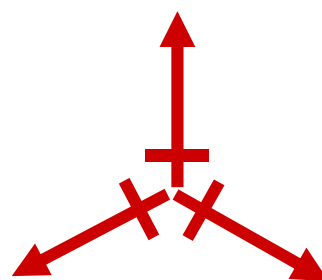
Non-polar molecule!



Molecular Polarity: Geometry



Polar B-F bonds!



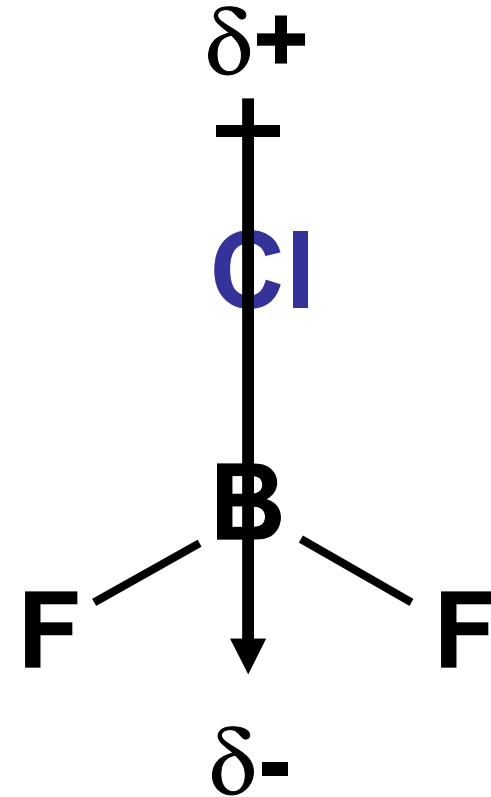
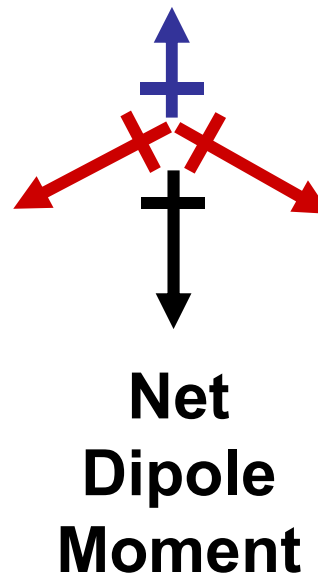
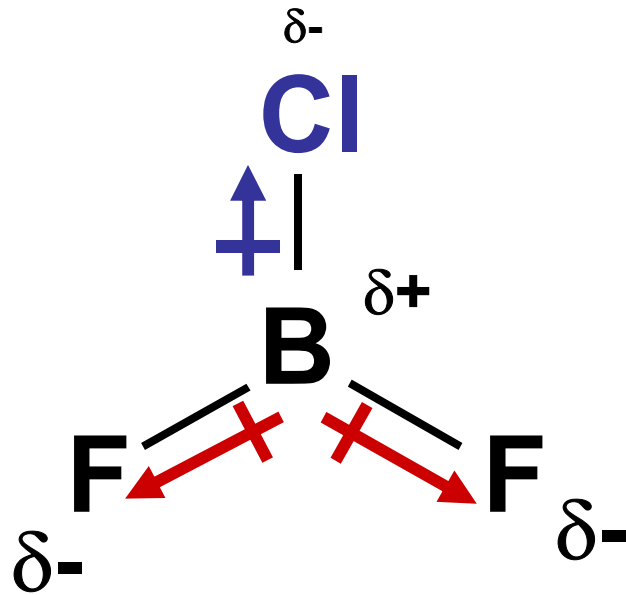
Like a 3-way
perfectly matched
tug-o-war,
there is no winner
and ...

...the BF_3 molecule is non-polar!

$$\mu = 0$$



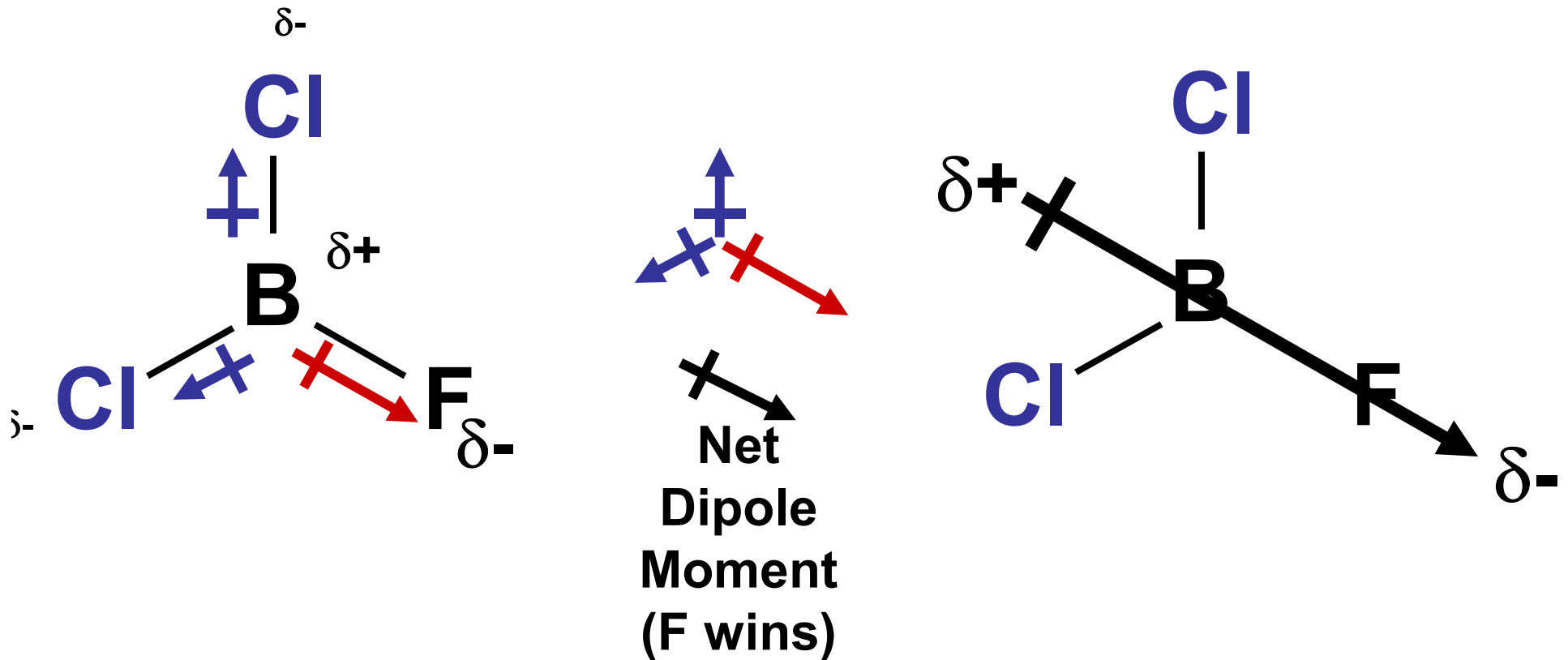
Molecular Polarity: Geometry



***...the $BClF_2$ molecule is polar!
(has pos. and neg. ends)***



Molecular Polarity: Geometry

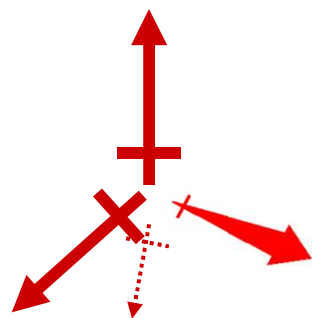
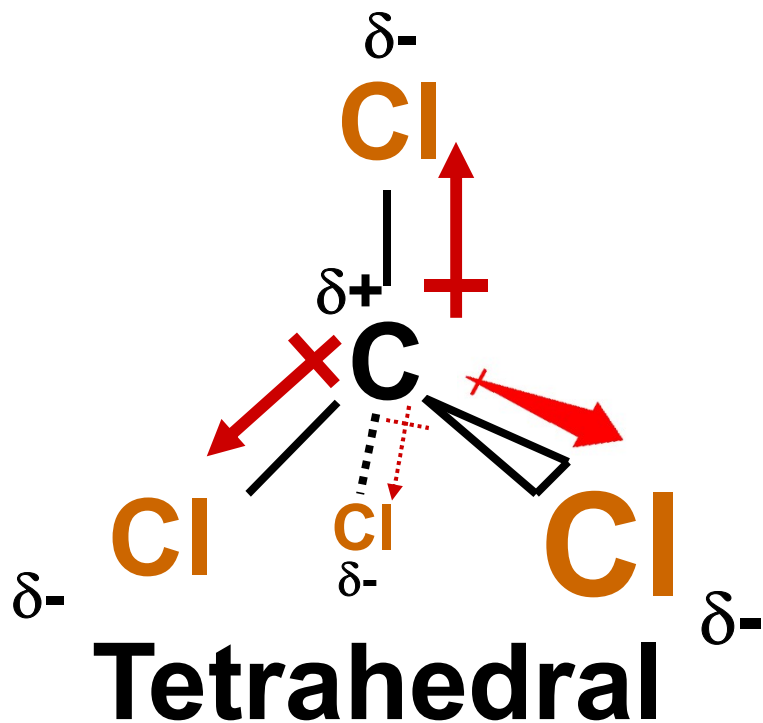


...the BCl_2F molecule is polar!

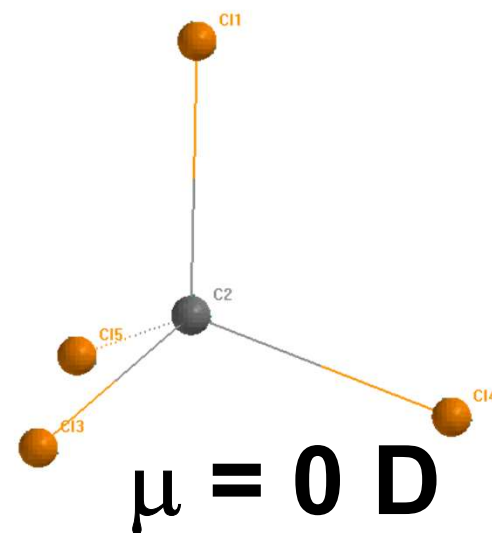
$(\mu \neq 0)$



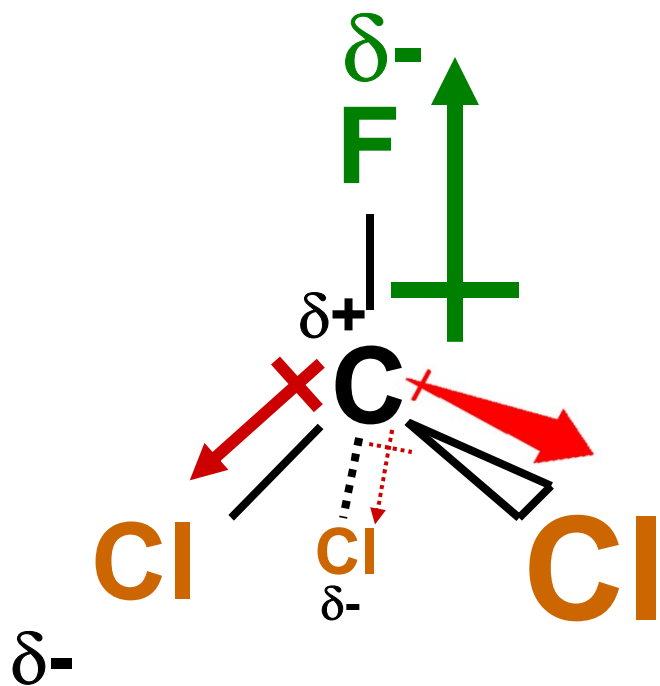
Molecular Polarity: Geometry



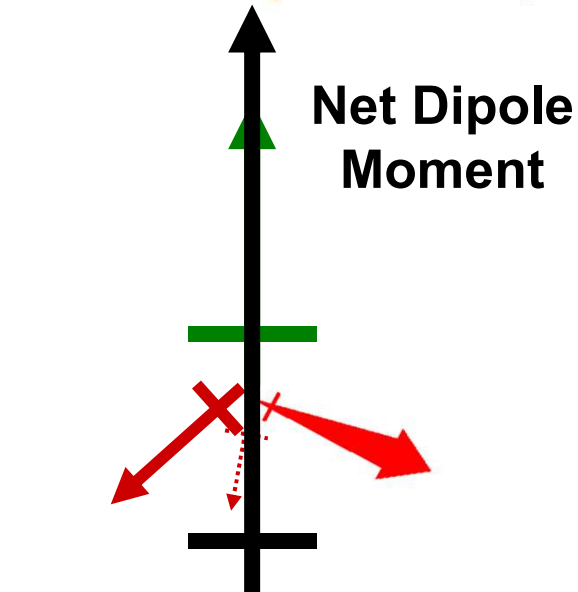
4-way perfectly
matched
tug-o-war...no
winner!



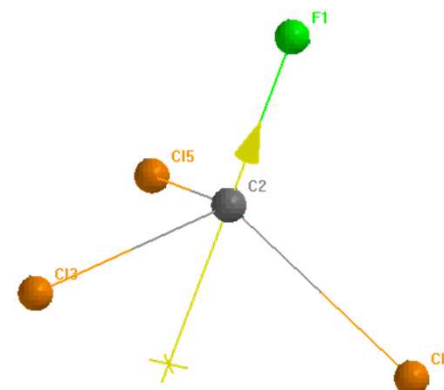
Molecular Polarity: Geometry



Tetrahedral



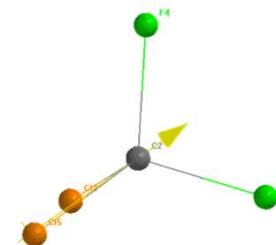
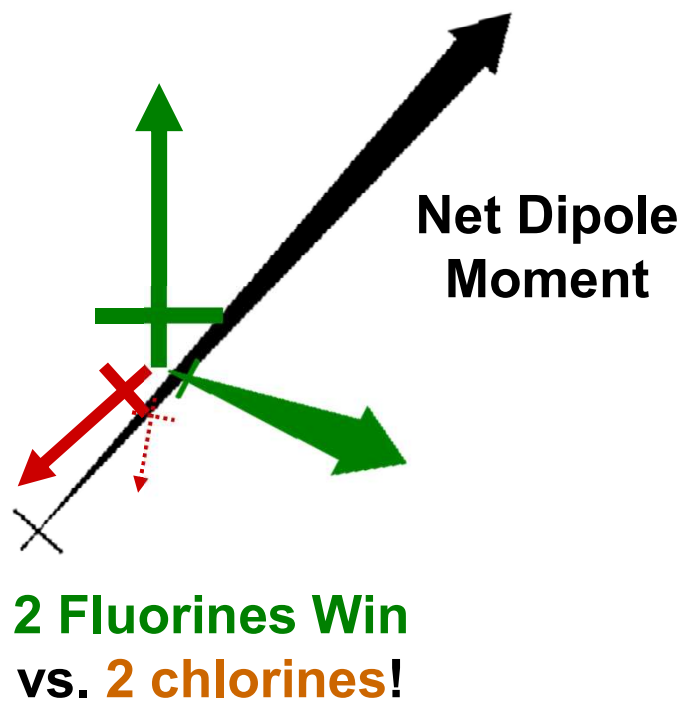
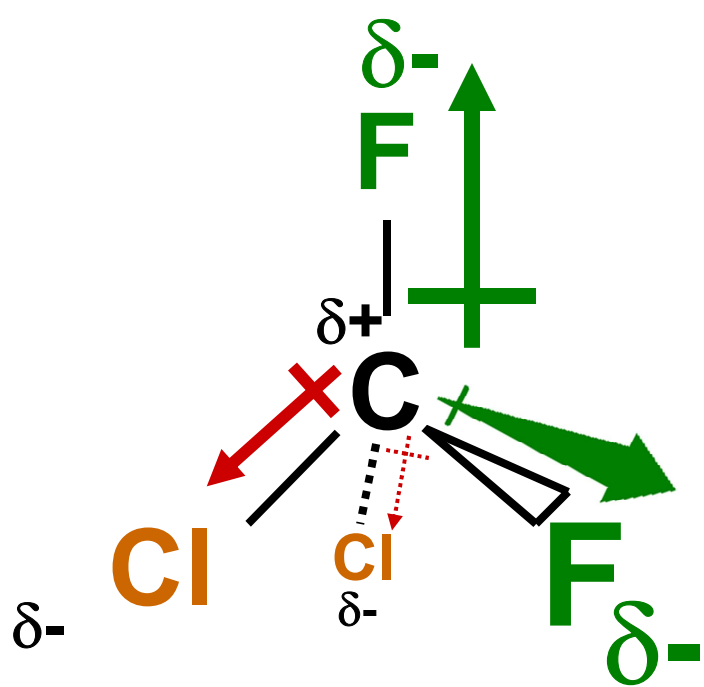
Fluorine Wins
...even when
pulling against
3 chlorines!



$\mu = 0.450 \text{ D}$



Molecular Polarity: Geometry

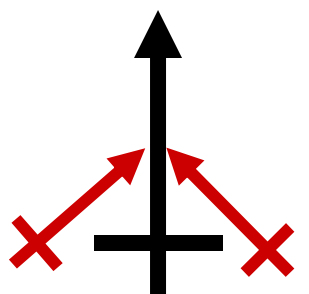
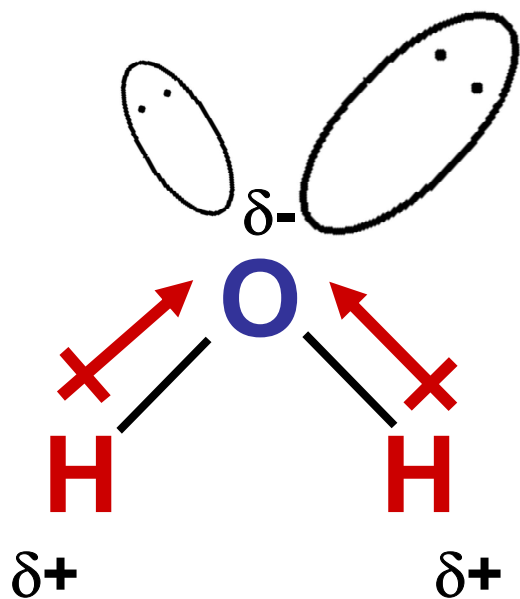
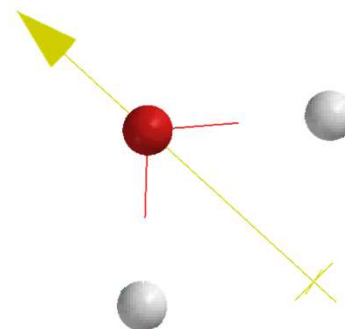


Tetrahedral

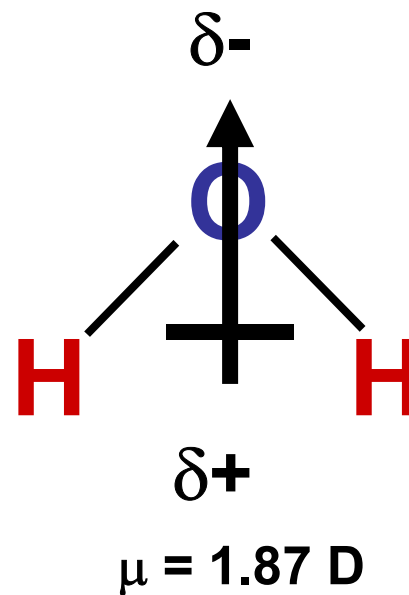
$\mu = 0.450 \text{ D}$



Molecular Polarity: Geometry



Net Dipole
Moment



Tetrahedral

