

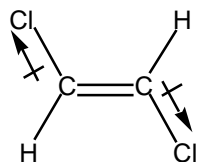
Answers to Problem Set #1
CH241-2001F

[1]

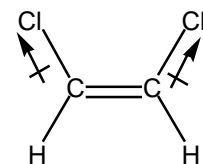


The ESR instrument will indicate that nitric oxide has an unpaired electron.

[2]

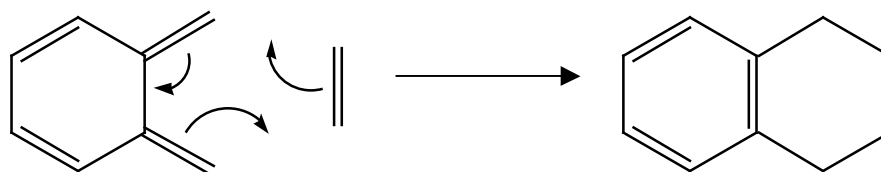


Molecular dipole moment is zero as individual bond dipole moments cancel.



Molecular dipole moment is nonzero as individual bond dipole moments do not cancel.

[3]

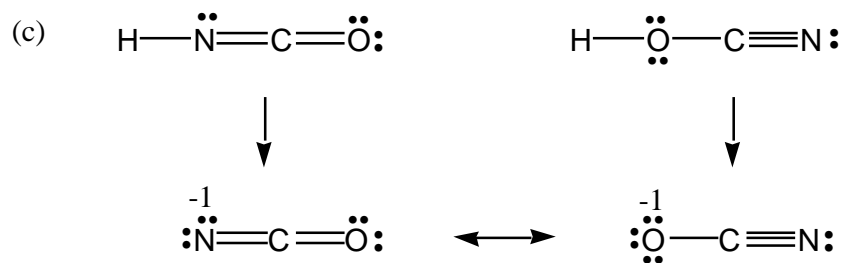


[4] The bond dipole depends not only on the magnitude of the separated charges but also on the distance separating the two charges. So, even though fluorine is more electronegative than chlorine, the greater length of the C-Cl bond accounts for the observed trend.

[5]



(b) The two compounds are clearly different as the atoms are connected in a different order. In one, H is attached to N, but in the other, H is bonded to O.



(d) Loss of a proton from either species results in the same anion! The two anionic structures shown above are simply resonance contributors to a *single* anion.