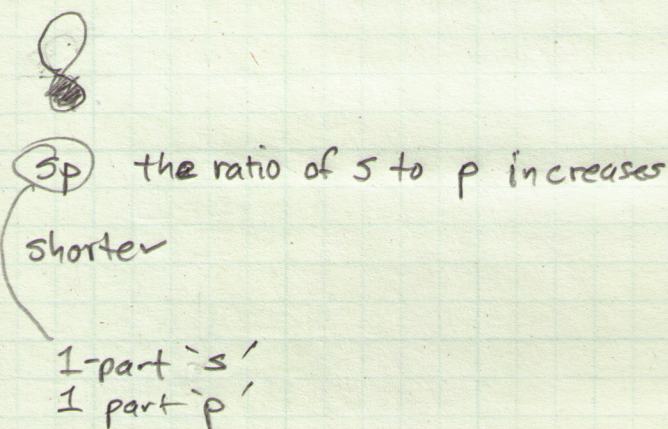
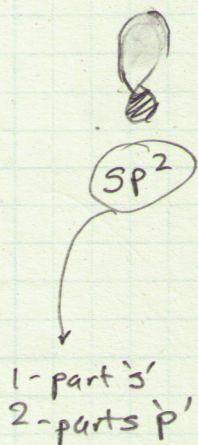
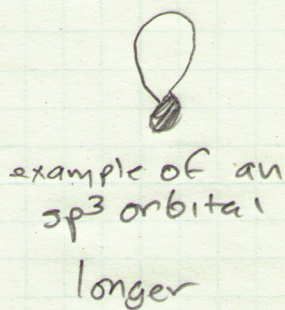


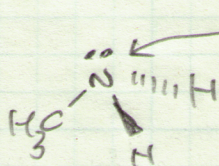
Orbital hybridization

sp^3 is an orbital comprising 1-part s + 3-parts p orbitals

$\therefore$ it has more 'p'-character than 's' characteristics



Review

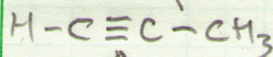


what orbitals are used by N in this molecule to house the lone pair e^- and make the σ bonds? sp^3

STERIC # = 4 = lone pair + σ bonds
 $\rightarrow$ need 4 atomic orbitals to hybridize

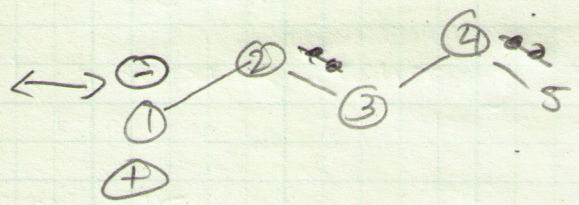
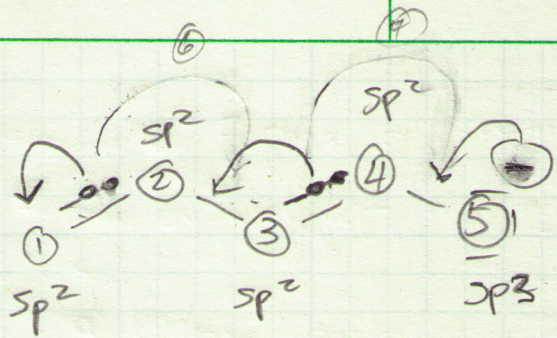
what is the molecular geometry? _____

" " " electron group " ? _____



what orbitals constructively overlap to make the σ bond between the carbons? $sp-sp$

$\rightarrow$ what orbitals overlap to make the π bond between these two carbons? $sp-sp^3$



Resonance Forms or Resonance Structures

- come by way of moving electron pairs occurring as

- ① a) a lone pair of electrons or
b) π electron pair

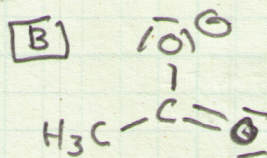
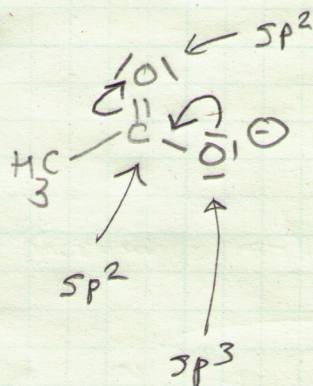
② These electrons can move to an

a) sp^2 or sp atom or

b) toward an sp^2/sp atom by forming a new π bond

Note! form [A] and [B] are equivalent

[A]



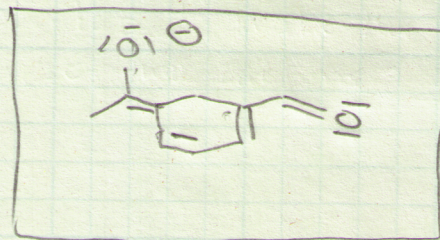
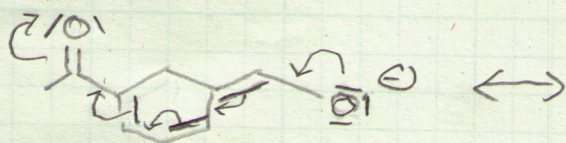
resonance arrow double-headed

lone pair e^- move toward sp^2 C to form "new" π bond

③ Use curved arrows to show movement of e^- pair

non-equivalent Resonance Forms

Draw a resonance structure so the neutral oxygen has a negative charge and the currently charge oxygen loses its charge



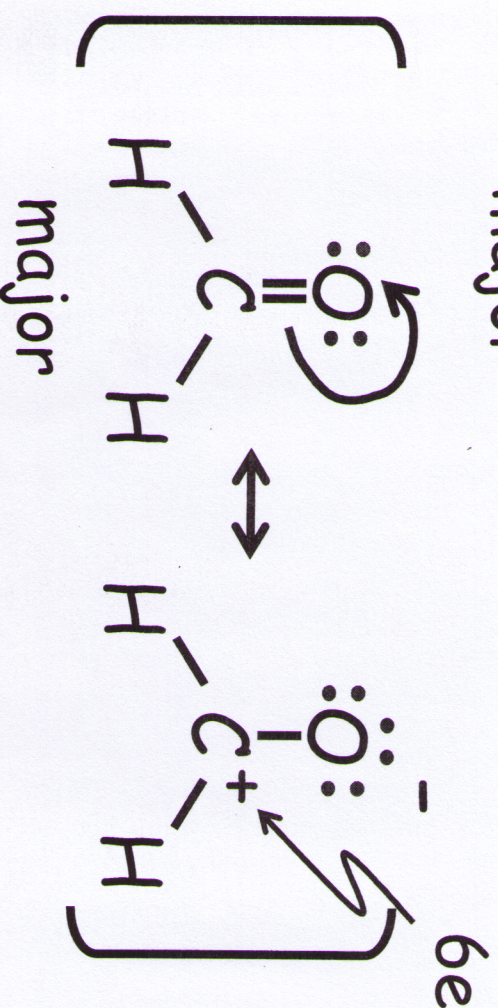
5-
Show curve arrows on this structure

Nonequivalent Resonance Forms

which ones are better?

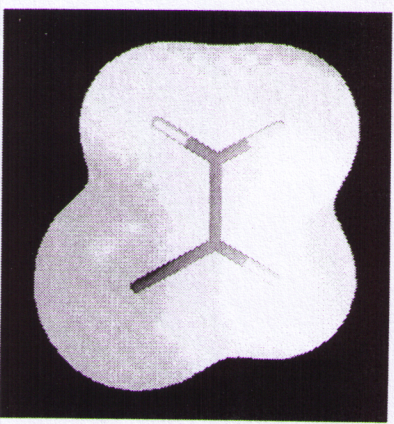
Rules

1. Octet rule (wins over all other)

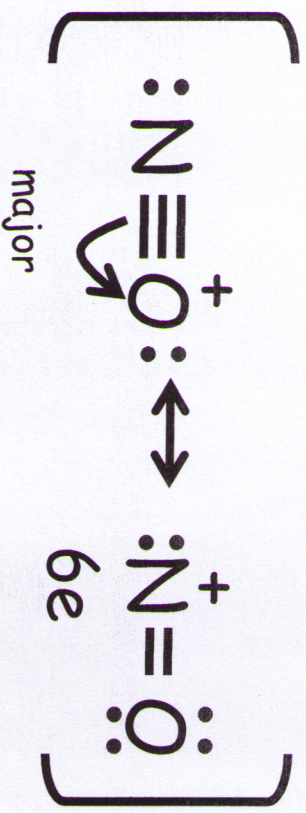
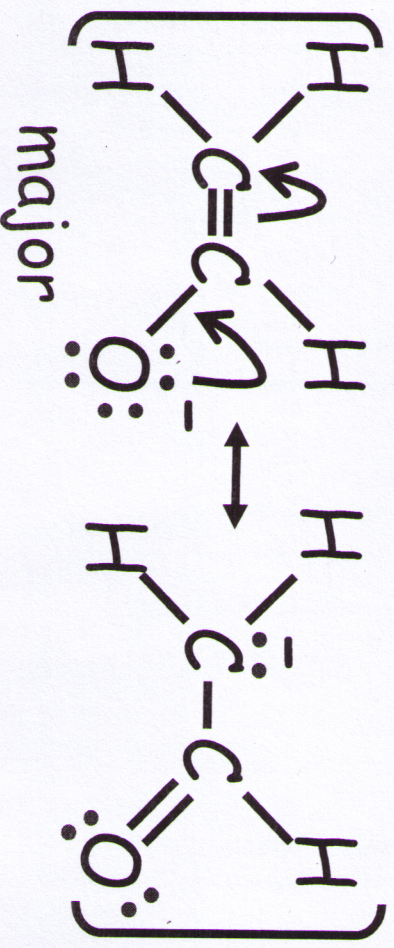


2. When there are two or more forms with complete octets: electronegativity rules.

Example: enolate ion

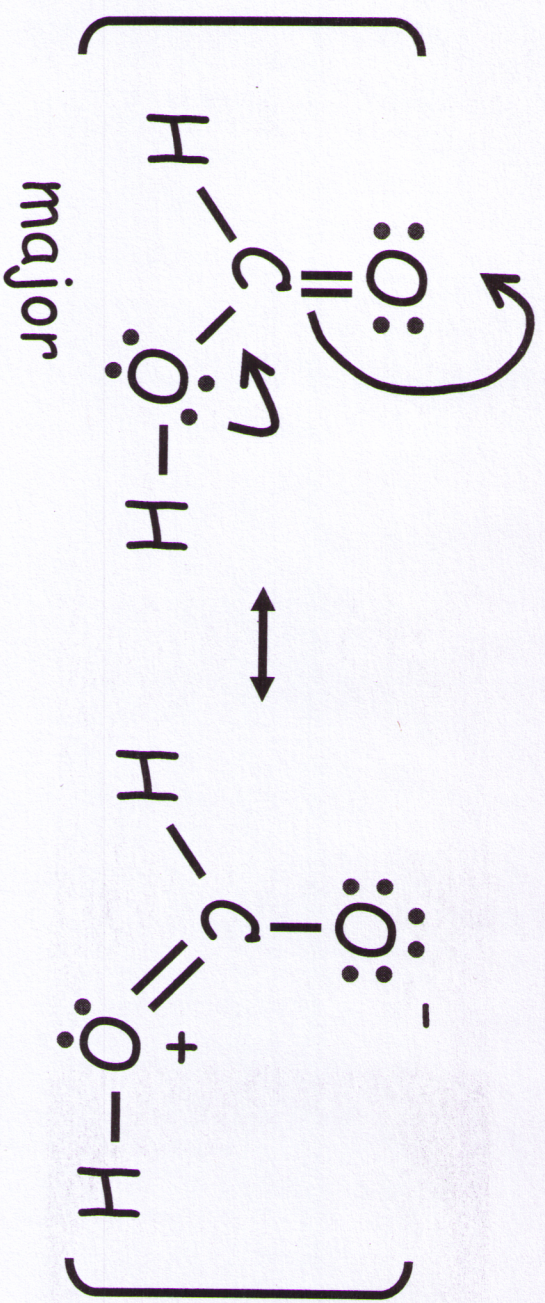


$\ominus$ charge on more e-negative element

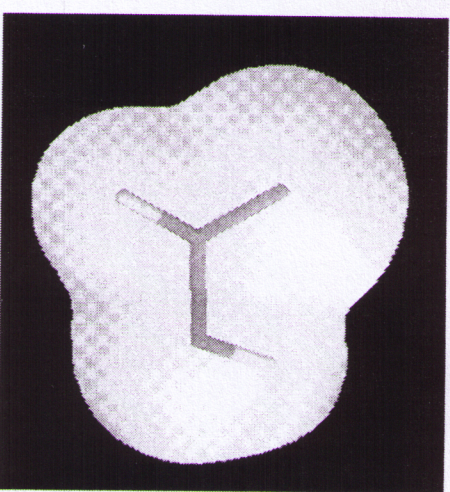


When in doubt, rule 1 wins!

3. Minimum charge separation



Formic acid



Note: $^-:\text{C}::\text{O}:^+$ Rule 1 wins !

6. Curved (full head) arrows show electron pair movement

The arrow starts where the electrons are currently located

The arrow ends where the electrons will end up after the electron movement

7. Account for formal charges. If a resonance structure has a net formal charge, then related resonance structure will have the same net formal charge.

