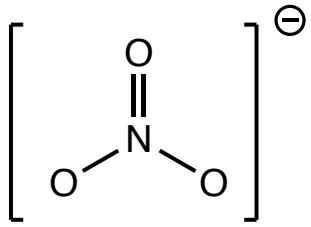
1.39 Å



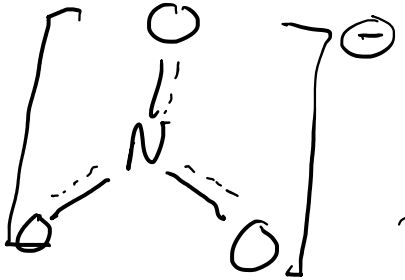
sb = 1.36 Å

db = 1.20 Å

actual = 1.28

— for single bond

- - for partial π bond



all bonds are the same . .

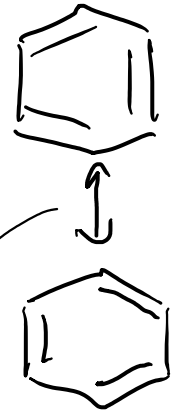
shorter than a single bond

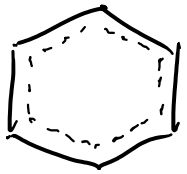
longer than a ~~double~~ double

Delocalized Electrons: Using resonance contributors to approximate molecular orbital theory

Section 8.3 & 8.4

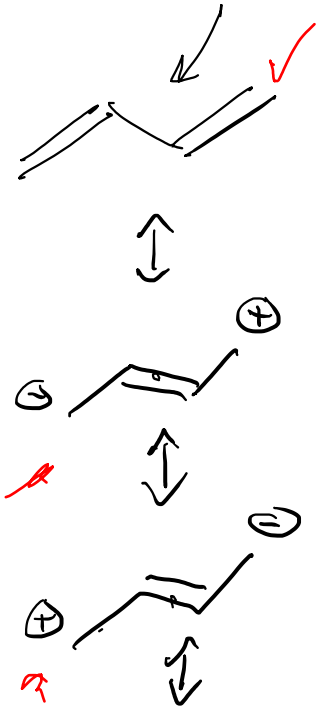
resonance structures





1,5 bond all the way around

1,3- butadiene



follows all mostly this Lewis structure rules

breaks rules

a tiny bit of this

breaks rules

rules

resonance contributors (structures)

arrow to say these are resonance contributors, not to say molecule is going back and forth

molecule isn't either of them

resonance hybrid is our best drawing of the molecule based on an average of the contributors

a weighted average

Rules for Drawing Resonance ~~Structures~~ contributors

Section 8.4

- Atoms don't move
- Don't move σ-bonds
- e^-'s in π bonds, lone-pair e^-'s, & unpaired e^-'s can be moved, (empty orbitals can be "moved")
- p orbitals must be able to line up parallel to each other
- p orbitals must be adjacent to each other
- some resonance structures are not considered reasonable & are not drawn

Using modeling kits to draw resonance structures