

(8) Today

3.1 Lewis Structures

3.1.1 Resonance and 3.1.3 Formal Charge

3.1.2 Expanded Octets

3.1.4 Failure of Lewis Structures to Predict Unusual Cases

Next Class (9)

3.1.4 Failure of Lewis Structures to Predict Unusual Cases

3.2 VSEPR

(10) Second Class from Today

3.2 VSEPR

3.3 Molecular Polarity

Third Class from Today (11)

4.1 Symmetry elements and Operations

4.2 Point Groups

Pat
Lewis Structures

table 1

thiocyanate



$$6 + 4 + 5 + 1 = 16/2$$

8 pairs

Connor
isocyanate

table 2



$$6 + 4 + 5 + 1 = 16/2$$

8 pairs

Emma Fulminate
Section 3.1

table 3

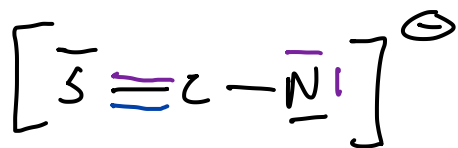
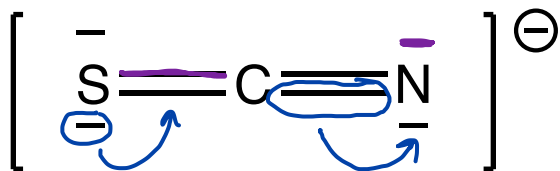
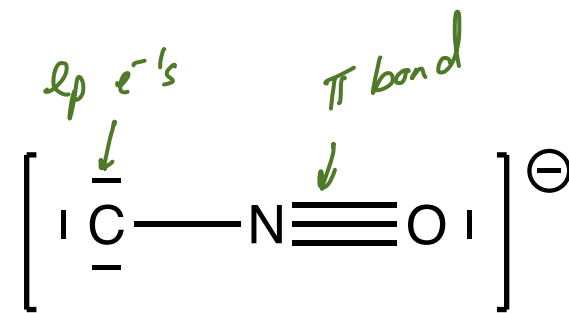
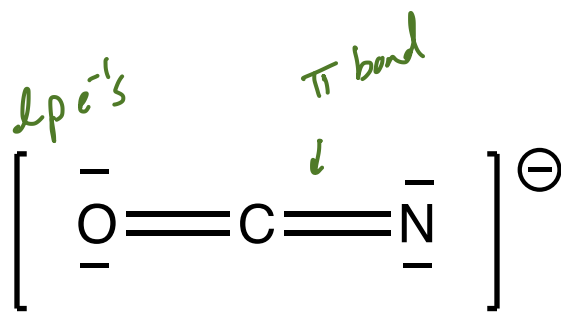
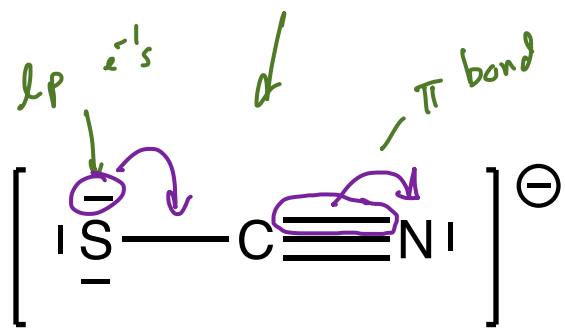


$$4 + 5 + 6 + 1 = 16/2$$

8 pairs

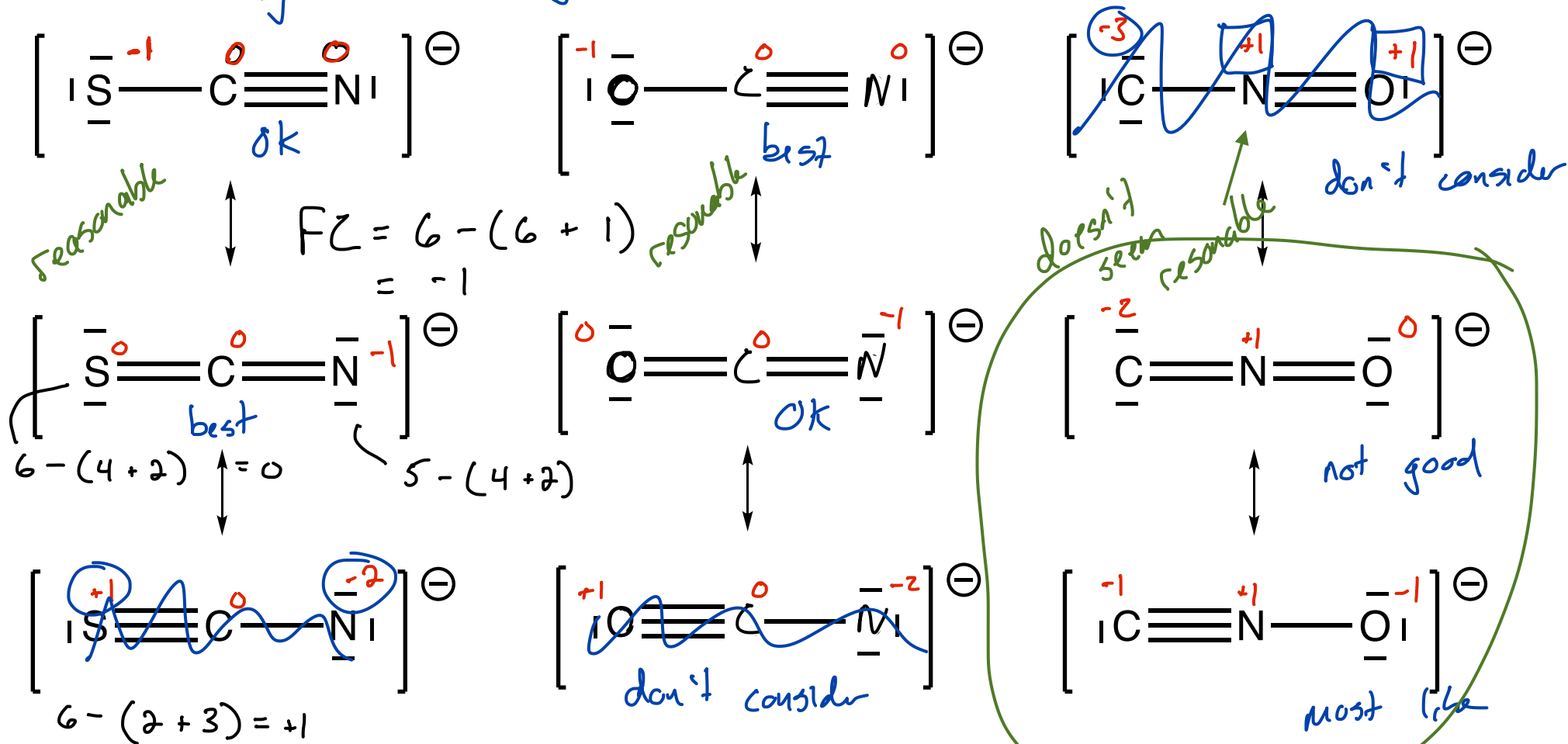
Lewis Structures: Resonance + electron delocalization

Section 3.1.1



isoelectronic same # of atoms
 same # of e⁻

Lewis Structures: Formal Charge *each contributor is drawn to contribute to our understanding of the molecule but they don't always contribute equally* Section 3.1.3

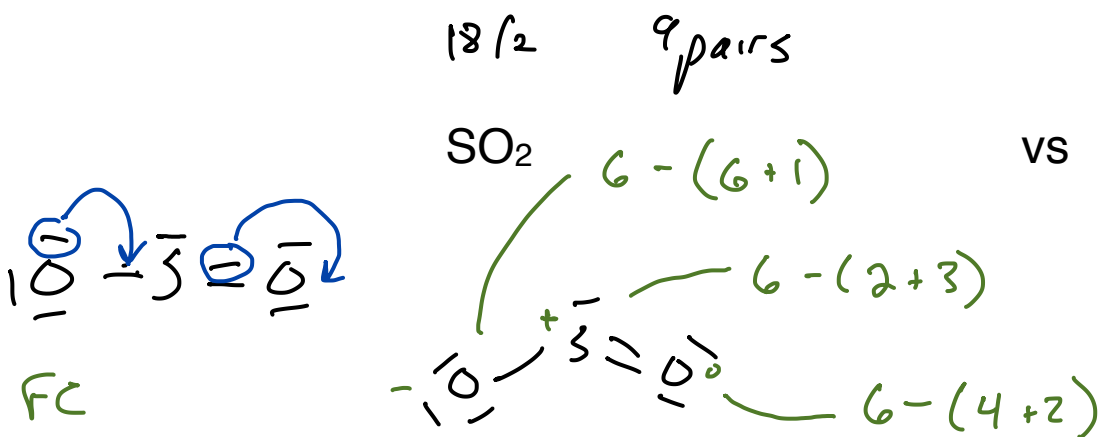


Things that increase the energy of the contributor & make it less important

charge separation, incomplete octets, "wrong" or "unexpected" charges

Lewis Structures: "Expanded" Shells

Section 3.1.2



FC

charge sep suggests high E

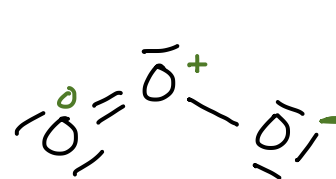
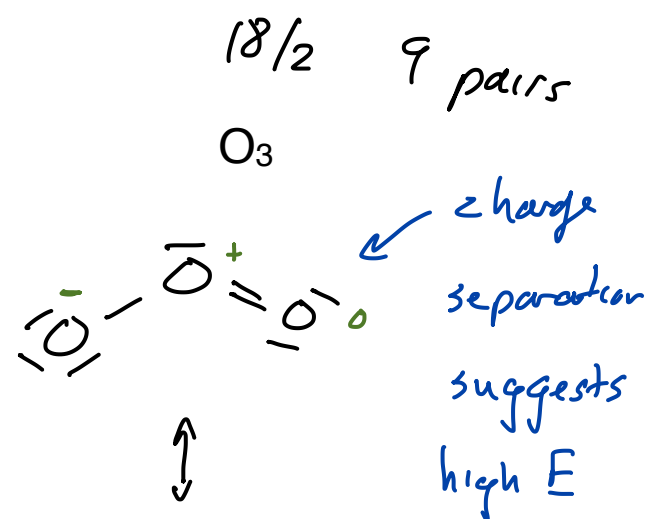
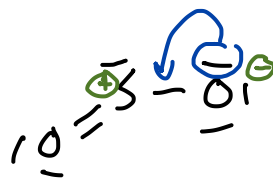
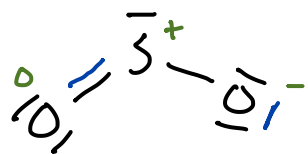
row 3 element

like S can

accommodate more

e^- 's

stable but reactive molecule



this is reactive and unstable ...

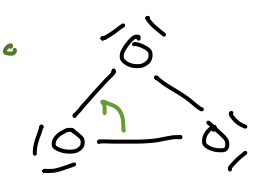
decomposes back to O_2

+ an O atom with a \oplus charge

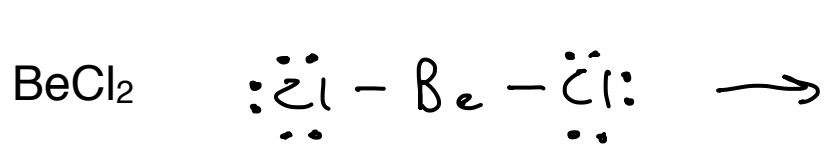
bond angle in an equilateral triangle would have to be 60°

sp^3 orbitals exist at 109.5° from each other

so they just wouldn't overlap enough to form a bond bond angle = 60° ... no way

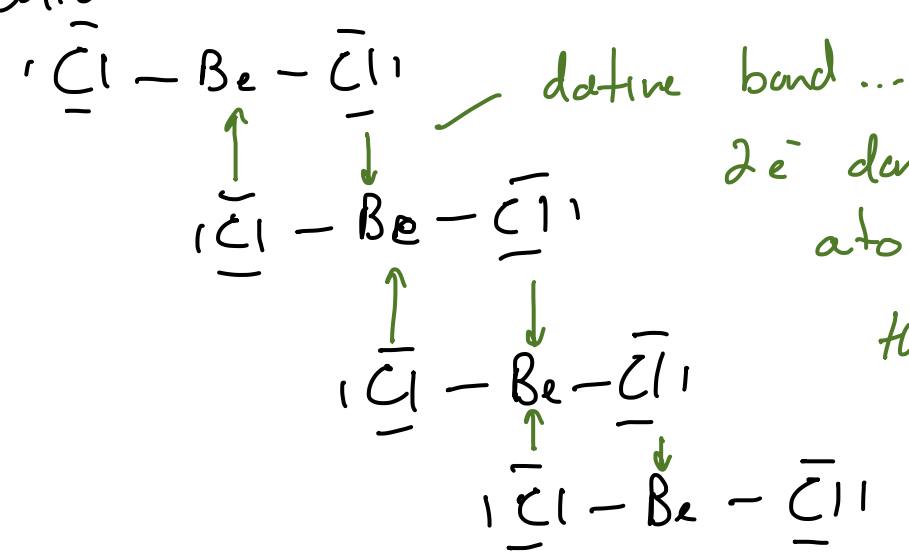


Lewis Structures: Be and B are Weird



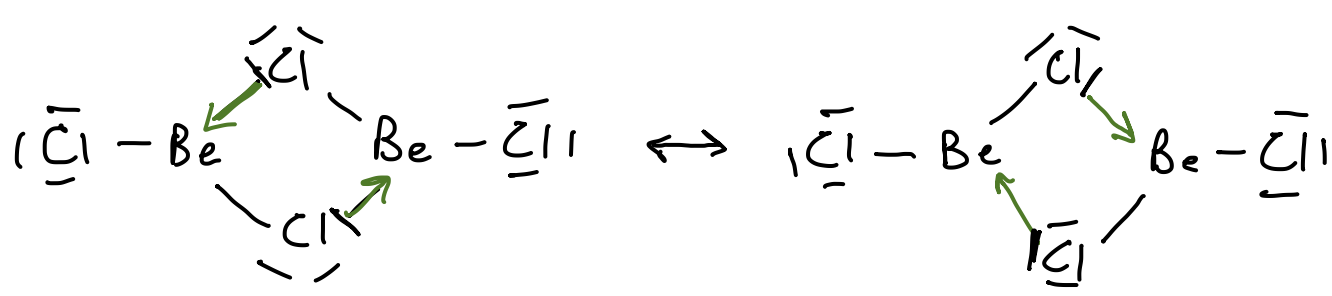
seems unreasonable
 since Cl usually picks up e⁻'s & Be does not have a particularly \oplus nucleus

as a solid

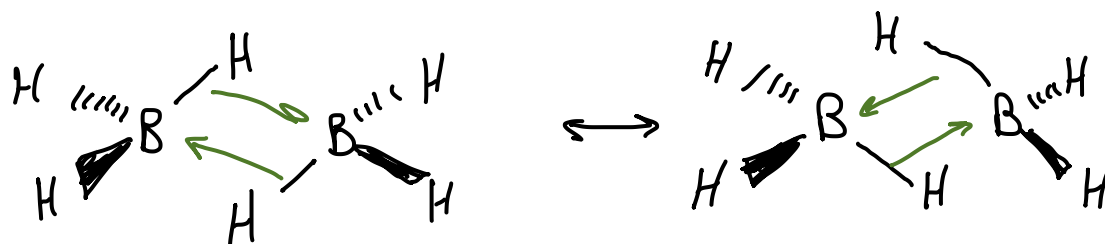


2 e⁻ donation of e⁻'s from 1 atom to another without that atom losing ownership of the e⁻'s

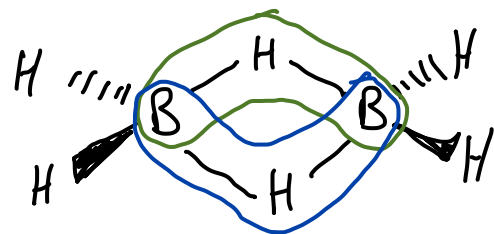
as a gas



~~Handwritten scribble~~ BH_3 as the empirical formula but 2 BH_3 's come together to form B_2H_6



3-center, 2- e^- bond



3-center, 2- e^- bond

