Announcements – Lecture X – Thursday, Oct 13th

1. **Third Lab – Saturday, October 24th … 1-4pm … ISB 155/160 (A-E)**

   a) *Print lab prior to coming to lab -- use the 'Print Friendly Version' located on the top left hand side of the page – this is the version that contains the 'Data Sheet' that you will hand in upon completing the lab.*

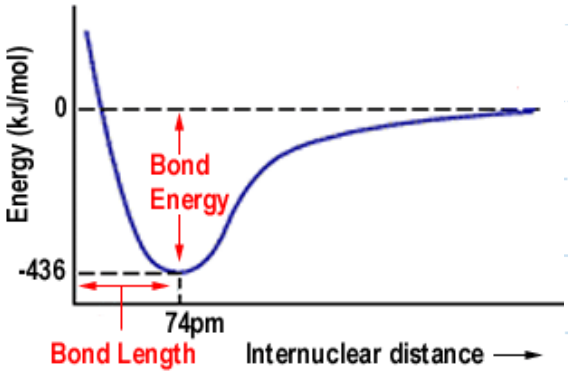
   b) *Second set of Lab Owls will appear in Owl after this lab. There are a total of 4 sets of Lab Owls and they are worth 25% of the Lab Grade.*

2. 

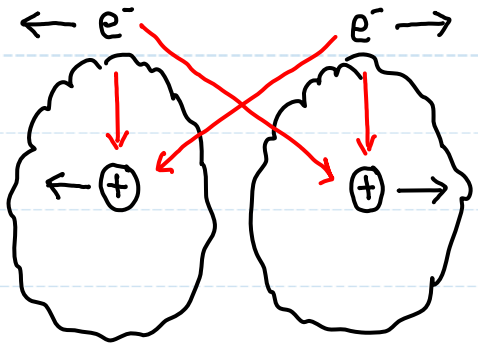
iClicker:
Choose any letter: A-E

3.7 What Is a Covalent Bond and How Does One Form?

A The Pro's and Cons of Orbital Overlap



See animation on class web site.



Con:

a) electron/electron repulsion.

b) proton/proton repulsion.

Pro:

a) electron/proton attraction.

3.7 What Is a Covalent Bond and How Does One Form?

C Drawing Lewis Structures of Covalent Compounds

Group I: Bond Pair and Lone Pair Electrons

CH_4

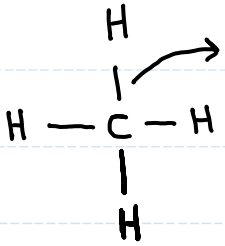
C: 4

H: 4(1)

8

4 x BP −8

0



Bond Pair (2 electrons)

BP = Bond Pair

NH_3

N: 5

H: 3(1)

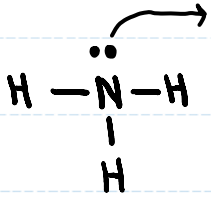
8

3 x BP −6

2

1 x LP −2

0



Lone Pair (2 electrons)

LP = Lone Pair

H_2O

O: 6

H: 2(1)

8

2 x BP −4

4

2 x LP −4

0

SiF_4

Si: 4

F: 4(7)

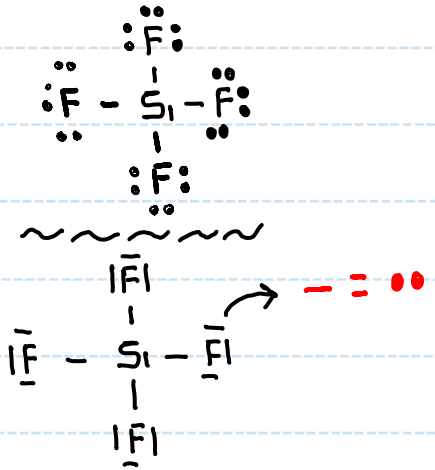
32

4 x BP −8

24

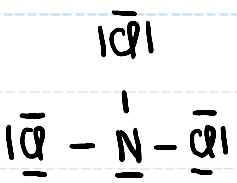
12 x LP −24

0



NCl_3

N: 5
Cl: 3(7)
26
3xBP -6
20
9xLP -18
2
1xLP -2
0



 # Lone pairs on Cl?
a) 1
b) 9
c) 3 ✓

Notes

1) The least electronegative atom in the center ... why? ... unless otherwise indicated.
2) Hydrogen ... 2 ... [He] ... all other atoms ... 8 ... [Ne] → [Rn].
3) Allocate electrons to the outer atoms first, then attend to the central atom.
4) Be able to distinguish beam Bond Pair (BP) and Lone Pair (LP) electrons.
5) Acceptable shorthand ... — = ••

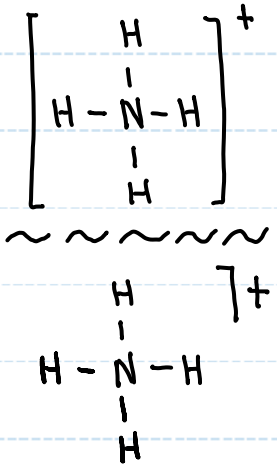
3.7 What Is a Covalent Bond and How Does One Form?

C Drawing Lewis Structures of Covalent Compounds

Group II: Dealing With Charges

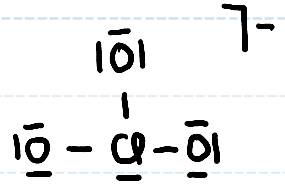
NH_4^+

N: 5
H: 4(1)
+: -1
8
4 x BP -8
0



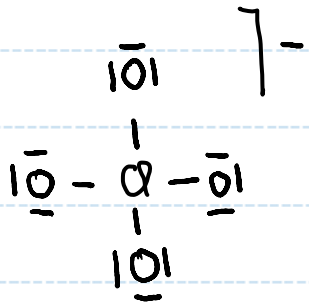
ClO_3^-

Cl: 7
O: 3(6)
-: 1
26
3 x BP -6
20
9 x LP -18
2
1 x LP -2
0



ClO_4^-

Cl: 7
O: 4(6)
-: 1
32
4 x BP -8
24
12 x LP -24
0



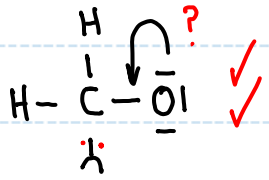
Notes

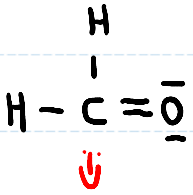
1) Negative charges increase the valence electron total.
2) Positive charges decrease the valence electron total.
3) Use parenthesis. Either [ ] or ⌉.

H_2CO

H: 2(1)
C: 4
O: 6
12

3 x BP -6
6
3 x LP -6
0





? = Two questions.

1). Do you have a terminal atom with at least one lone pair on it ?

2). Are both atoms that are about to form a multiple bond members of CNOPS ?

If yes to both questions, then a multiple bond can be made.

HCN

H: 1
C: 4
N: 5
10

2 x BP -4
6
3 x LP -6
0