

Notes 02/20

Wednesday, February 20, 2008
9:57 AM

Midterm Distribution

0-9	0
10-19	0
20-29	1
30-39	4
40-49	10
50-59	15
60-69	18
70-79	33
80-89	20
90-100	8

D-F

D

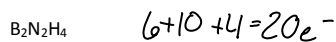
C

B

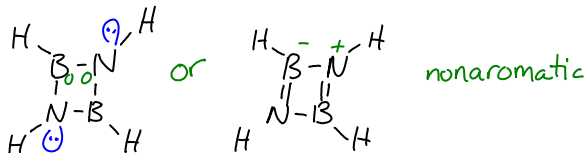
A

Average: 69

Draw Structure

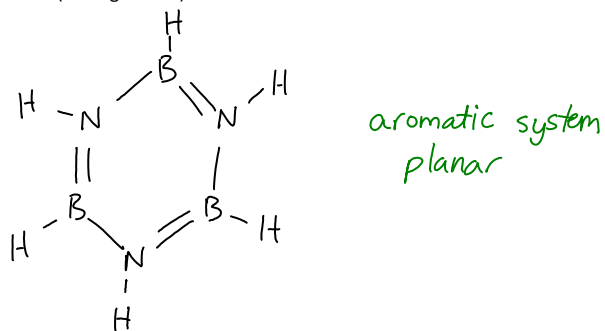


B-B dimer with boron-boron bonds is bad place to start
need to catenate (alternate) atoms

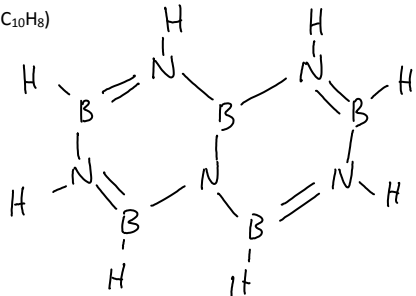


C_4H_4 also has 20 valence e^- so it is isoelectronic to $B_2N_2H_4$. They should roughly have the same structure

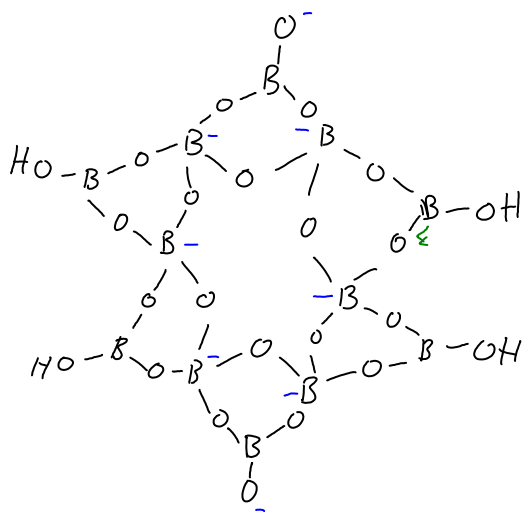
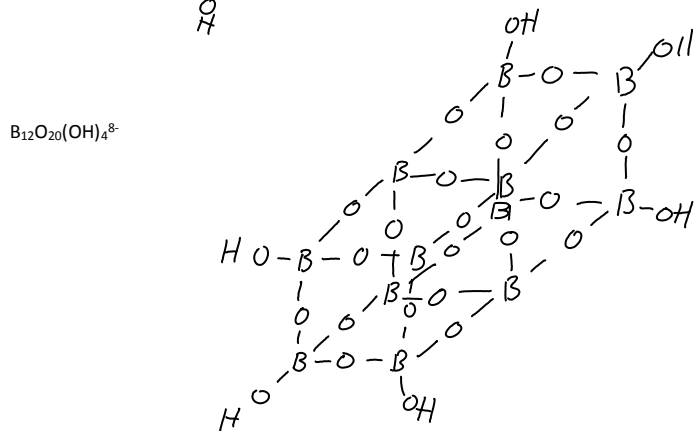
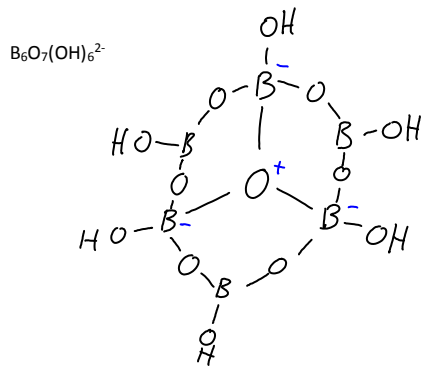
$B_3N_3H_6$ (analog of C_6H_6)



$B_5N_5H_{10}$ ($C_{10}H_{10}$)

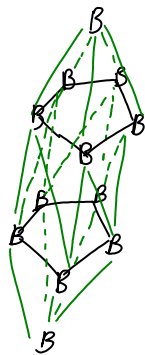


Reactions of Boron overhangs (do not memorize, but know they exist)



← correct structure

$B_{12}H_{12}^{2-}$ icosahedron



Boron has only 3 valence electrons yet this icosahedron has 5 bonds. This is accounted for because each bond has less than 2 electrons

Array of icosahedrons (see VOH slide) alpha-rhombohedral boron

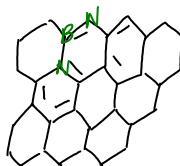
CaB_6

(see VOH slide)

Eight cubes with Ca^{2+} at corners
Octahedral in center of each cube

BN (extended structure)

Isoelectronic with C



Graphite - corners are carbon

BN - alternating B and C at corners

They are then stacked on each other to make 3d structure

In graphite, each layer is slightly offset from previous because an eclipsed structure because of repulsive forces

In BN, layers are directly above each other in eclipsed structure because B and N can interact