

Notes 02/11

Monday, February 11, 2008

9:47 AM



Notes 0211

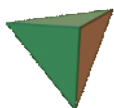
Audio recording started: 10:01 AM Monday, February 11, 2008

Five Platonic Solids

1. Cube

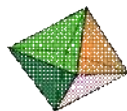


a. Tetrahedron



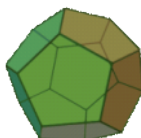
a. Octahedron

- 8 triangular faces
- 6 vertices
- 12 edges



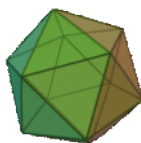
a. Dodecahedron

- 12 faces
- 20 vertices
- 30 edges



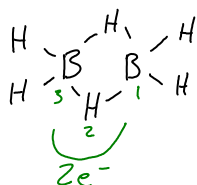
a. Icosahedron

- 20 faces
- 12 vertices
- 30 edges



Survey of main group compounds:

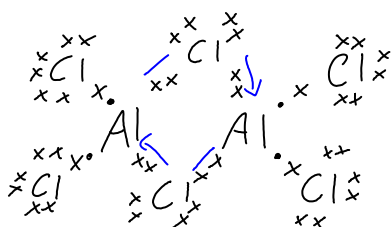
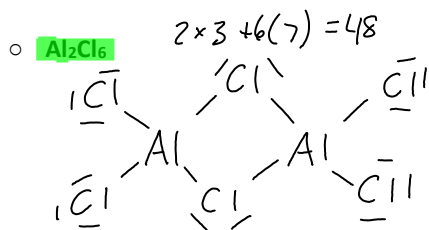
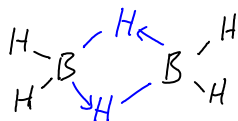
- **Boron** - likes 3 bonds (6 electrons, less than octet)
 - BH_3
 - B_2H_6 (not very stable)



3 center - 2 electron bonds

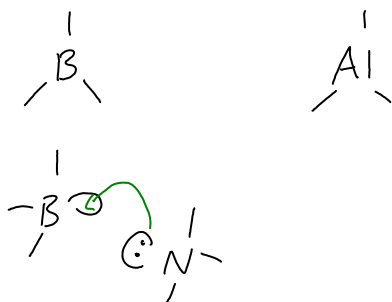
$2e^-$

also drawn as:



formal charge: -1

Elements like boron and aluminum in 3 coordinate, they have p orbital sticking out of paper toward reader

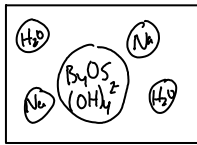


coordinate bond results from lewis base-lewis acid pair

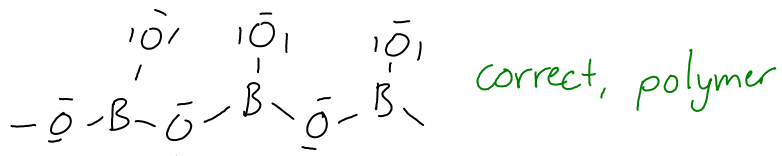
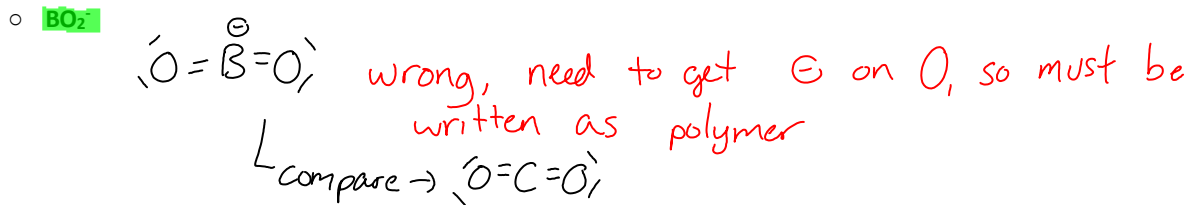
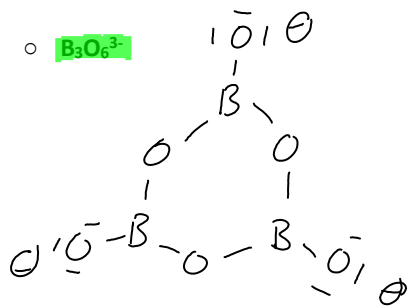
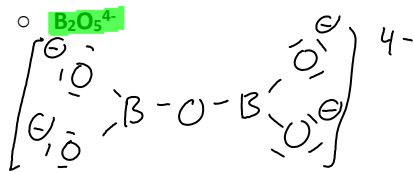
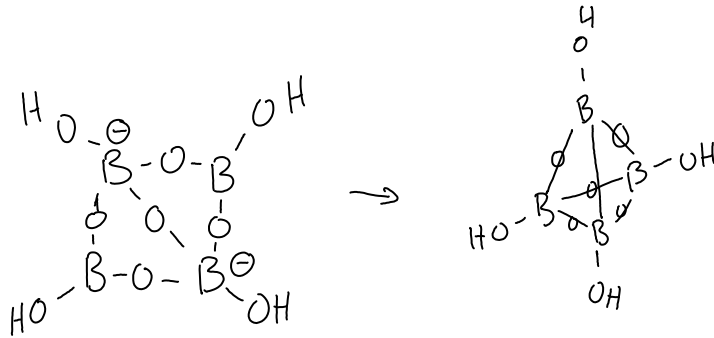
Boron is Lewis acid because it accepts lone pair
Ammonia is Lewis base because it donates lone pair

- More Boron

- o Borax - $Na_2B_4O_5(OH)_4 \cdot nH_2O$ ($n=8$ for borax)
 - Ionic solid

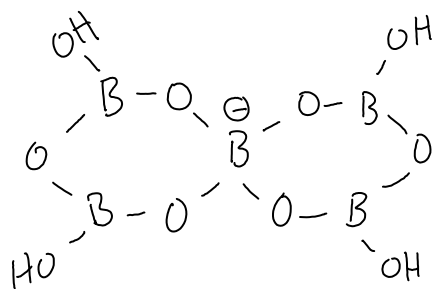


$B_4O_5(OH)_4^{2-} \rightarrow$ complex ion



$\text{O}^-=\text{B}-\text{O}^-$ $\ominus$ not good because boron likes to be lewis acid & prefers being polymer

o $[\text{B}_5\text{O}_6(\text{OH})_4]^-$



or

