Chemistry 20	Unit 1
Lesson 2: Introductory Stereochemistry	84 mins

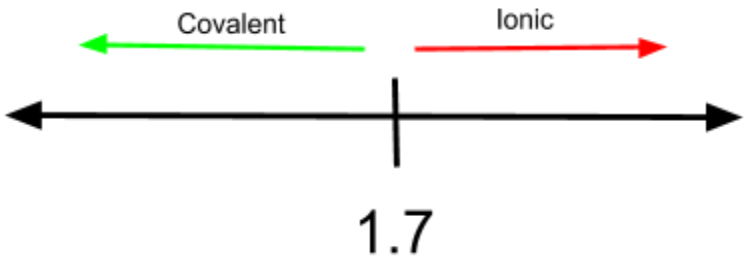
Electronegativity

- How hard atoms pull on e^-
- Determines the nature of chemical bonds
- Remember that Metal-Non-metal thing… this is why I said most of the time

$KCl_{(s)}$
K (0.8)
Cl (3.2)
Difference in Electronegativity: 3.2 - 0.8 = 2.4
2.4 > 1.7 ∴ Ionic

$AlP_{(s)}$
Al (1.6)
P (2.2)
Difference in Electronegativity: 2.2 - 1.6 = 0.6
0.6 < 1.7 ∴ covalent

Electronegativity Difference



Bond Polarity

- If there is a difference in electronegativity than the electrons will be shared unevenly, creating a polar bond.

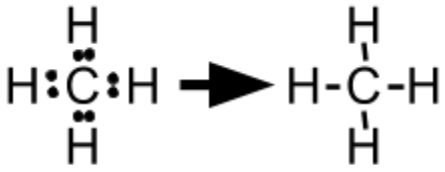
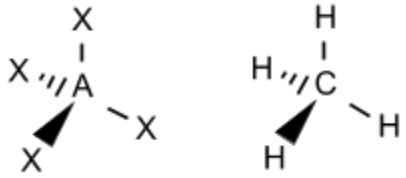
O=O 3.4 3.4	3.4 - 3.4 = 0.0 - Nonpolar covalent bond (e^- shared evenly)
δ^+ δ^- C≡O 2.6 3.4	3.4 - 2.6 = 0.8 - Polar covalent (e^- shared unevenly)

Stereochemical (3D) Diagrams

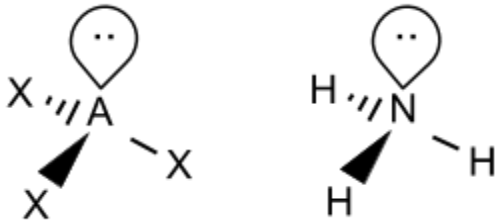
- structural drawing attempting to show the molecule in 3D VSEPR Theory - <u>Valence</u> Shell <u>Electron</u> Pair <u>Repulsion</u> - e^- push molecules into certain shapes	Symbols A - Central Atom X - Peripheral Atoms (surrounding) E - Electron Pairs on **central atom**

Types

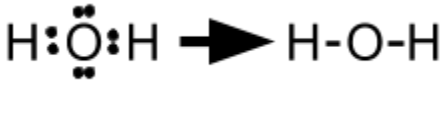
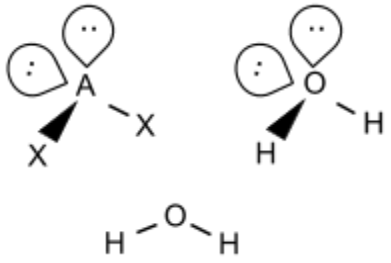
Tetrahedral (AX_4)

$CH_{4(g)}$  LEWIS Structural 	

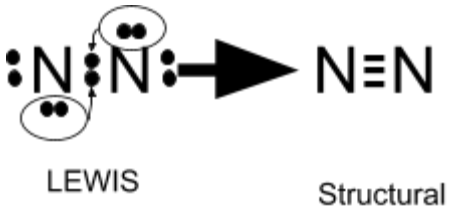
Trigonal Pyramidal (AX_3E)

$NH_{3(g)}$  LEWIS Structural	

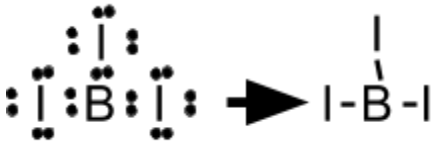
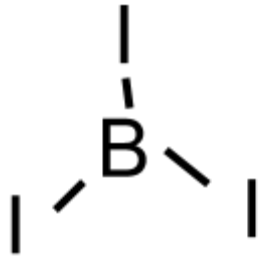
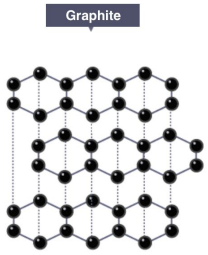
Bent/Angular (AX_2E_2)

$H_2O_{(l)}$  LEWIS Structural	

Linear (AXE_3, AX_2, AX)

Examples AXE_3 (HCl, BrF)  	AX_2 (CO_2, CS_2, BeF_2) 

Trigonal Planar (AX_3)

Examples (BI_3,BH_3, CH_2O)  	 Graphite… 

Extra Examples

$CH_3SH_{(aq)}$ - (Tetrahedron)

$OOCCOO^{2-}{}_{(aq)}$ - (Trigonal Planer)

Challenge

$SF_{6(g)}$

Chemistry 20 - Stereochemistry Practice

Name: _____

Complete all of the following problems to the best of your ability. Ensure that you show all of your work as appropriate. Should you encounter difficulties, please refer to your notes or section 3.3 of your textbook.

Compound	Lewis Diagram	General Formula	Stereochemical (3-D) Diagram
Carbon dioxide			
Ammonia			
Ammonium ion			
Boron trifluoride			

Hydrogen cyanide			
Sulfur dichloride			
Sulfite ion			
Carbon disulfide			
CH_2Cl_2			
Methanol, $CH_3OH_{(l)}$			