

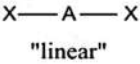
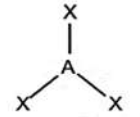

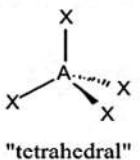
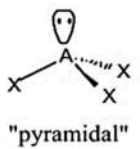

Recap:

1. What is the Octet Rule? What is the "HONC" Rule?

Hybridization: _____

- The _____ is determined by the _____
- The _____ is determined by the _____

# Sets	Orbital Hybridization
2	
3	
4	
Sets= # things (atoms and lone pairs) around central atom	

Number of Electron Groups	Electron Group Arrangement	Number of Lone Pairs	VSEPR Notation	Molecular Geometry	Ideal Bond Angles	Hybridization about the Central Atom
2	linear	0	AX ₂	 "linear"	180°	sp
<hr/>						
3	trigonal planar	0	AX ₃	 "trigonal planar"	120°	sp ²
		1	AX ₂ E	 "bent"	120°	sp ²
<hr/>						
4	tetrahedral	0	AX ₄	 "tetrahedral"	109.5°	sp ³
		1	AX ₃ E	 "pyramidal"	109.5°	sp ³
		2	AX ₂ E ₂	 "bent"	109.5°	sp ³

A =

X =

E =

2. Fill in the table below:

Compound	Lewis Structure	VSEPR Formula	Hybridization	Shape
HCN				
CH ₄				
BF ₃				
PCl ₃				
H ₂ O				
*Cl ₂				

*All _____ are _____ in shape

Polarity of MOLECULES (the entire compound)

- Comparing _____ between 2 atoms in a bond, for _____ in the compound
- If there is an _____ between bonded atoms, and the molecule is _____ then the **compound** is _____
- If there is an _____ between bonded atoms, and the molecule is _____ then the **compound** is _____
- If there is _____ between bonded atoms, and the molecule is _____ then the **compound** is _____

Polarity Practice: Look back at the Lewis Structures you drew for the molecules on the previous page

Molecule	Shape	Is the COMPOUND completely symmetrical?	Is the entire COMPOUND polar or nonpolar?
HCN			
CH ₄			
BF ₃			
PCl ₃			
H ₂ O			
Cl ₂			

***Whether a compound is polar or nonpolar determines the types of attractive forces between its molecules**

Intermolecular Forces (sometimes referred to as “Van der Waals forces”)

- _____
- These are NOT BONDS, which are an attraction _____

3 Main Types of Intermolecular Forces:

- **London Dispersion Forces**
 - The _____ intermolecular force
 - Is the main attractive force between _____
 - In general, the _____ the molecule, the _____ the dispersion forces
- **Dipole-Dipole Forces**
 - Stronger than dispersion forces
 - The main attractive force between _____
- **Hydrogen Bonding:** is a type of intermolecular force; it is NOT actually a bond!
 - The _____ intermolecular force
 - Only occur in molecules containing _____ AND one of the following: _____, _____, or _____ (NOF)

Let's go back to the compounds we looked at on the previous page...

Molecule	Is the entire compound polar or nonpolar (look at symmetry)?	Does the compound contain H and either N, O, or F?	Main type of intermolecular forces between molecules of this compound
HCN			
CH ₄			
BF ₃			
PCl ₃			
H ₂ O			
Cl ₂			

Putting it all together...

	Essential Information:	Structure:	Essential Questions:	Additional Information:
CF₄	Total valence electrons:		VSEPR Formula:	Polar or Nonpolar Molecule:
	Bonded electrons:		Geometry/Shape:	Major intermolecular force:
	Electrons in lone pairs:		Hybridization:	
NH₃	Total valence electrons:		VSEPR Formula:	Polar or Nonpolar Molecule:
	Bonded electrons:		Geometry/Shape:	Major intermolecular force:
	Electrons in lone pairs:		Hybridization	
C₂H₂	Total valence electrons:		VSEPR Formula:	Polar or Nonpolar Molecule:
	Bonded electrons:		Geometry/Shape:	Major intermolecular force:
	Electrons in lone pairs:		Hybridization	
H₂CO	Total valence electrons:		VSEPR Formula:	Polar or Nonpolar Molecule:
	Bonded electrons:		Geometry/Shape:	Major intermolecular force:
	Electrons in lone pairs:		Hybridization	

	Essential Information:	Structure:	Essential Questions:	Additional Information:
CH₂F₂	Total valence electrons:		VSEPR Formula:	Polar or Nonpolar Molecule:
	Bonded electrons:		Geometry/Shape:	Major intermolecular force:
	Electrons in lone pairs:		Hybridization	
O₂	Total valence electrons:		VSEPR Formula:	Polar or Nonpolar Molecule:
	Bonded electrons:		Geometry/Shape:	Major intermolecular force:
	Electrons in lone pairs:		Hybridization	
CO₂	Total valence electrons:		VSEPR Formula:	Polar or Nonpolar Molecule:
	Bonded electrons:		Geometry/Shape:	Major intermolecular force:
	Electrons in lone pairs:		Hybridization	
H₂S	Total valence electrons:		VSEPR Formula:	Shape:
	Bonded electrons:		Geometry/Shape:	Molecular polarity:
	Electrons in lone pairs:		Hybridization	Major intermolecular force: