

Key

* Due Wed!

BONDING REVIEW (RChem)

1. Complete the review information below.

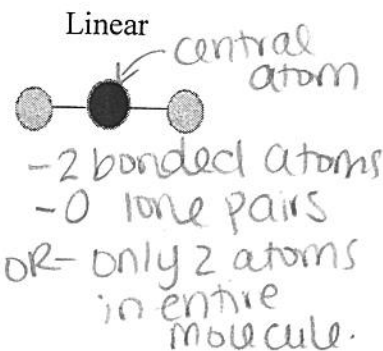
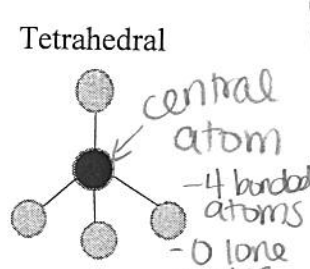
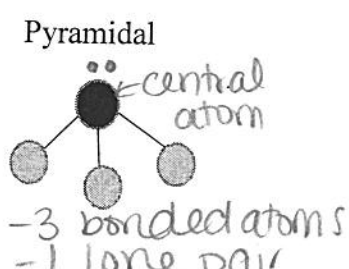
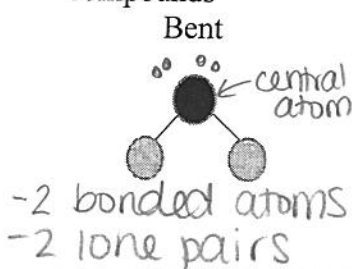
TYPE OF BOND: Based on elements present and electronegativity difference

Ionic bond: Occurs between metal and nonmetal; Eneq Difference ≥ 1.7

Polar Covalent Bond: Occurs between different nonmetals; Eneq Difference bigger than 0, lower than 1.7

Nonpolar Covalent Bond: Occurs between identical nonmetals; Eneq Difference = 0

MOLECULE SHAPE: Based on the number of shared and unshared electron pairs in covalent compounds



MOLECULAR POLARITY: Related to the distribution of charge in the molecule

Nonpolar molecule: symmetrical distribution of charge

polar molecule: asymmetrical (uneven) distribution of charge

INTERMOLECULAR ATTRACTION: Related to molecular polarity

Dispersion forces: occur between nonpolar molecules

Dipole-dipole attractions: occur between polar molecules

Hydrogen bonding: occurs between molecules of H-N, H-O, H-F only

weakest IMF (lowest mp/bp)

↓

strongest IMF (highest mp/bp)

2. Then, complete the charts on the following pages.

**If bonding present is covalent, identify the shape of the molecule, polarity and intermolecular force present between molecules of the substance.

Formula	Dot Diagram	Type of Bond	Molecular Shape	Molecular Polarity	Intermolecular Attraction
HI		polar cov.	linear	polar	dipole-dipole
Cl ₄		polar cov.	tetra.	non-polar	dispersion
H ₂ S		polar cov.	bent	polar	dipole-dipole
NH ₃		polar cov.	pyramidal	polar	Hydrogen bonds
H ₂		nonpolar cov.	linear	nonpolar	dispersion

Formula	Dot Diagram	Type of Bond	Molecular Shape	Molecular Polarity	Intermolecular Attraction
CH ₃ Cl	$ \begin{array}{c} \text{H } \delta+ \\ \\ \text{:}\ddot{\text{Cl}}-\text{C}-\text{H } \delta+ \\ \\ \text{H } \delta+ \end{array} $	polar cov.	tetra.	polar	dipole-dipole
O ₂	$ \text{:}\ddot{\text{O}}=\ddot{\text{O}}\text{:} $	nonpolar cov.	linear	nonpolar	dispers.
SiH ₄	$ \begin{array}{c} \text{H } \delta- \\ \\ \delta- \text{H} - \text{Si} - \text{H } \delta- \\ \\ \text{H } \delta- \end{array} $	polar cov.	tetra.	nonpolar	dispers.
CO ₂	$ \begin{array}{c} \delta- \quad \delta+ \quad \delta- \\ \text{:}\ddot{\text{O}}=\text{C}=\ddot{\text{O}}\text{:} \end{array} $	polar cov.	linear	nonpolar	dispers.
N ₂	$ \text{:}\ddot{\text{N}}\equiv\ddot{\text{N}}\text{:} $	nonpolar cov.	linear	nonpolar	dispers.

Formula	Dot Diagram	Type of Bond	Molecular Shape	Molecular Polarity	Intermolecular Attraction
HF	$\begin{array}{c} \delta+ \\ \text{H} - \text{F} : \\ \delta- \end{array}$	polar cov.	linear	polar	hydrogen bonding
PH ₃	$\begin{array}{c} \delta- \\ \text{H} - \text{P} - \text{H} \\ \\ \text{H} \end{array}$	non-polar (same EN)	pyramidal	polar	dipole-dipole
NaBr	$[\text{Na}]^{+1} \quad [:\ddot{\text{Br}}:]^{-1}$	ionic →	N/A	N/A	N/A
MgO	$[\text{Mg}]^{+2} \quad [:\ddot{\text{O}}:]^{-2}$	<u>ionic</u>	N/A	N/A	N/A
K ₃ P	$\begin{array}{l} [\text{K}]^{+1} \\ [\text{K}]^{+1} \\ [\text{K}]^{+1} \end{array} \quad [:\ddot{\text{P}}:]^{-3}$	<u>ionic</u>	N/A	N/A	N/A