Using Models to Predict Molecular Structure

Name: _Jaqueline Martinez_

Time: _1:00_

M   T   (W)   R   F

tetrahedral
trigonal planar
Bent
linear

Sp
Sp2
Sp3

PART A. Molecular Models

Molecule	Lewis Structure	Molecular Structure*	Polarity (P or NP)	Isomers (draw structures)	Hybridization
CH_2Cl_2		Tetrahedral	P	none	sp^3
$C_2H_2Br_2$		Trigonal Planar	NP		sp^2
P_4		tetrahedral	NP	none	sp^3
NH_4^+		tetrahedral		none	sp^3

*Specify the shape and hybridization about each "central" atom.

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Molecule	Lewis Structure	Molecular Structure*	Polarity (P or NP)	Isomers (draw structures)	Hybridization
H_2S	:S: / \ H H	Bent	NP	none	sp^2
N_2	:N≡N:	linear	NP	none	sp
HCl	:Cl̈–H	linear	Polar	none	sp
C_2H_2	H–C≡C–H	linear	Polar	none	sp
CH_4O	H :Ö: || | H–C–C–H || H	tetrahedral	polar	none	sp^3
C_2H_4	H\ /H C=C H/ \H	Bent	NP	none	$sp2$
SO_2	S /\\ :O O:	bent	NP	none	$sp2$
SO_4^{2-}	:O: || :Ö–S∭Ö:⊖ ▼ || :Ö :O:	tetrahedral	NP	none	sp^3

F

PART B. Predicting Stability

If the following molecules satisfy the <u>octet rule</u>, write "stable." If not, write "unstable."

P→follows
octet rule

Cl→more
than octet
rule
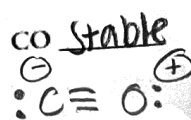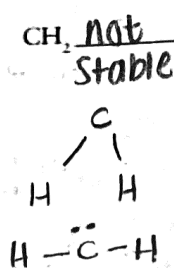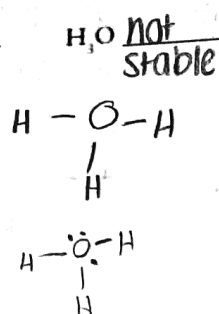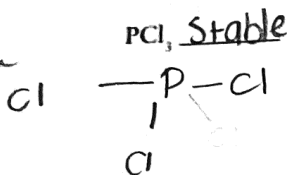
PCl₃ **Stable**

Cl

$$-P-Cl$$

Cl

H₂O **not**
Stable

H — O — H

H

H — Ö — H

H

CH₂ **not**
Stable

C

H   H

H — C̈ — H

CO **Stable**

:C ≡ O:
⊖   ⊕

4 − 5 = −1 ⊖

6 − 5 = 1 ⊕

4 − 1 = 3

1 − 1 = 0

5

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Lab Report
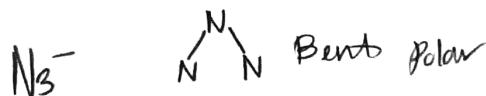
Name: Jaqueline Martinez

Time: 1:00

M T (W) R F

PART C. Individual Assignments

Molecule	Lewis Structure	Molecular Structure*	Polarity (P or NP)	Isomers (draw structures)	Hybridization
$C_3H_6Br_2$	H—C—C—C—Br with H's and Br	Polar	4s	sp^3

tetrahedral

N_3^- N N N   Bent   Polar sp^2

*Specify the shape and hybridization about each "central" atom.

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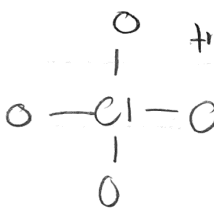
■ **Using Models to Predict Molecular Structure**

PART C. Individual Assignments *(continued)*

Molecule	Lewis Structure	Molecular Structure*	Polarity (P or NP)	Isomers (draw structures)	Hybridization
ClO_4^-	O — Cl — O with O above and O below	trigonal	NP	non	sp^3
$SeCl_2$	Cl — Se — Cl	linear	NP	Se with Cl, Cl	sp