Name: Period: Date:

Molecular Shapes using VSEPR

For each of the following molecules: 1) write the name, 2) draw the Lewis Dot Structure, 3) indicate the molecular shape, and 4) state bond angles.

Cl_2

chlorine gas
linear 180°
nonpolar covalent
London Forces

O_2

oxygen gas
linear 180°
nonpolar covalent
London Forces

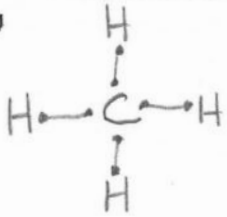
N_2

nitrogen gas
linear 180°
nonpolar covalent
London Forces

HCl

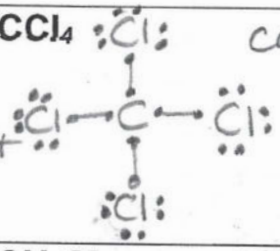
hydrochloric acid
linear 180°
polar covalent
dipole-dipole

CH_4



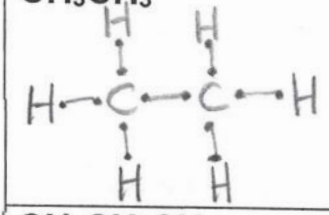
methane
tetrahedral
109.5°
nonpolar covalent
London Forces

CCl_4



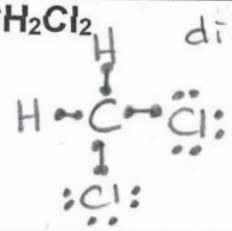
carbon tetrachloride
tetrahedral
109.5°
nonpolar covalent
London Forces

CH_3CH_3



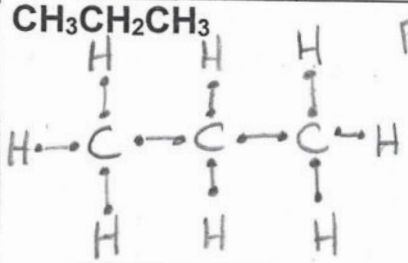
ethane
tetrahedral
109.5°
nonpolar covalent
London Forces

CH_2Cl_2



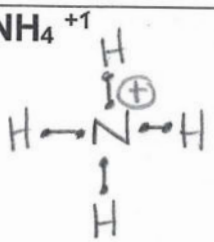
dichloro-methane
tetrahedral
109.5°
polar covalent
dipole-dipole

$CH_3CH_2CH_3$



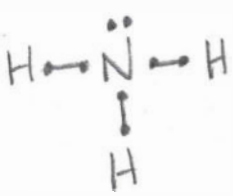
propane
tetrahedral
109.5°
nonpolar covalent
London Forces

NH_4^{+1}



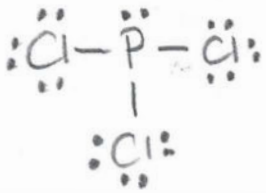
ammonium ion
tetrahedral 109.5°
polar Ionic
"cation"
ion-ion attraction

NH_3



ammonia
trigonal pyramidal
107°
polar covalent
Hydrogen Bonding

PCl_3



phosphorus trichloride
trigonal pyramidal
107°
polar covalent
dipole-dipole

organic hydrocarbons

Organic names based on carbon

1 C =	meth	4 C's =	but
2 C's =	eth	5 C's =	pent
3 C's =	prop	6 C's =	hex

Covalent prefixes

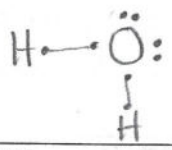
mono
di
tri
tetra
penta
hexa

Name: Period: Date:

Molecular Shapes using VSEPR

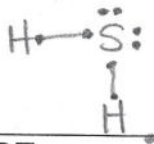
For each of the following molecules: 1) write the name, 2) draw the Lewis Dot Structure, 3) indicate the molecular shape, and 4) state bond angles.

H_2O water



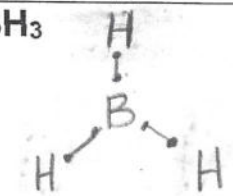
Bent 105°
Polar Covalent
Hydrogen Bonding

H_2S dihydrogen sulfide (dry) hydrosulfuric acid (wet)



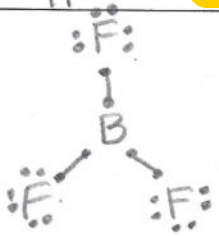
Bent 105°
Polar Covalent
Dipole - dipole

BH_3



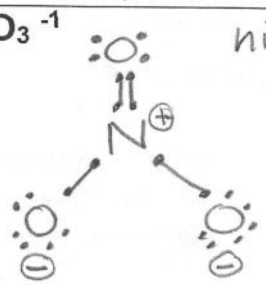
Boron trihydride
Trigonal planar
120°
Non polar covalent
London Forces

BF_3



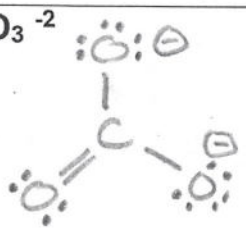
Boron trifluoride
Trigonal planar
120°
Nonpolar covalent
London forces

NO_3^{-1}



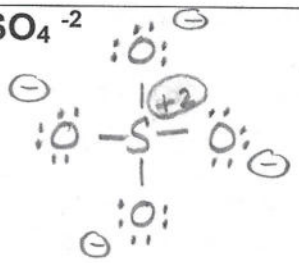
nitrate ion
trigonal planar
120°
polar Ionic
"anion"
ion-ion attraction

CO_3^{-2}



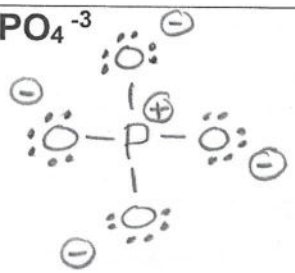
carbonate ion
trigonal planar
120°
polar ionic
"anion"
ion-ion attraction

SO_4^{-2}



Sulfate ion
tetrahedral
109.5°
polar Ionic
"anion"
ion-ion attraction

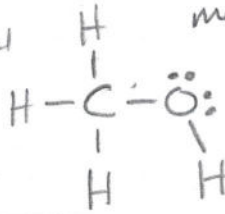
PO_4^{-3}



phosphate ion
tetrahedral
109.5°
polar Ionic
"anion"
ion-ion attraction

CH_3OH methanol

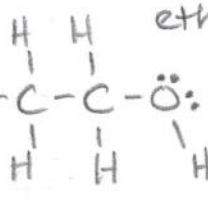
C: Tetrahedral
109.5°
nonpolar
London



O: Bent
105°
polar
Hydrogen Bonding

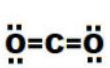
CH_3CH_2OH ethanol

C: Tetrahedral
109.5°
nonpolar
London



O: Bent
105°
polar
Hydrogen Bonding

CO_2

Also drawn as 

Carbon dioxide
linear 180°
non polar
London

CO

carbon monoxide
linear 180°
polar covalent
dipole-dipole

Meth = 1
Eth = 2
Prop = 3

* organic must contain Carbon & Hydrogen *