
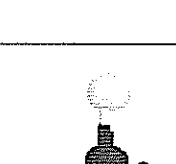
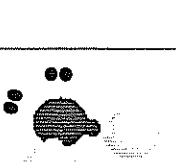





Chemistry 2nd Semester Review Part II - 2009

KEY

Molecular Shapes and Bond Angles

Molecule	# BP	#UBP	Geometry based on this shape	Bond Angle(s)	Molecular Shape	Bond Angle(s)
	6	0	OCTAHEDRAL	90	OCTAHEDRAL	90
	4	2	OCTAHEDRAL	90	SQUARE PLANAR	90
	5	0	TRIANGULAR BI-PYRAMIDAL	120 & 90	TRIANGULAR BI-PYRAMIDAL	120 & 90
	3	1	TETRAHEDRAL	109.5	TRIANGULAR PYRAMIDAL	<109.5 (ABOUT 107)
	2	1	TRIANGULAR PLANAR	120	BENT	<120 (ABOUT 118)
	3	0	TRIANGULAR PLANAR	120	TRIANGULAR PLANAR	120
	4	1	TRIANGULAR BI-PYRAMIDAL	120 & 90	SEE-SAW	<120 & 90
	2	2	TETRAHEDRAL	109.5	BENT	<< 109.5 (ABOUT 105)

Molecule	# BP	#UBP	Geometry based on this shape	Bond Angle(s)	Molecular Shape	Bond Angle(s)
	5	1	TRIANGULAR BI-PYRAMIDAL	120 & 90	SQUARE PYRAMIDAL	90 & < 90
	4	0	TETRAHEDRAL	109.5	TETRAHEDRAL	109.5
	3	2	TRIANGULAR BI-PYRAMIDAL	120 & 90	T-SHAPE	<90

Draw Lewis Dot Diagrams for the Following Covalent Compounds. When you finish drawing the correct Lewis structure, tell how many bonded pairs of electrons are present as well as the number of unbonded pairs of electrons are present. **If the structure resonates, you must draw all possible structures.**

1. carbon tetrachloride (CCl₄)

bonded pairs = 4

unbonded pairs = 0

Shape based on = tetrahedral

Molecular Shape = tetrahedral

Bond Angles = 109.5

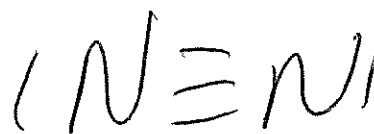
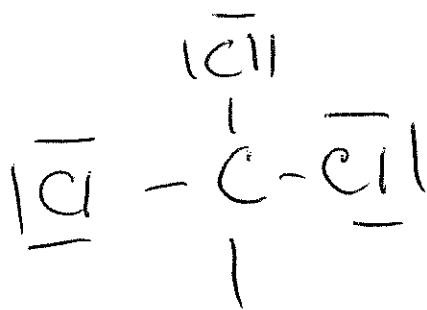
2. nitrogen gas (N₂)

bonded pairs = 2

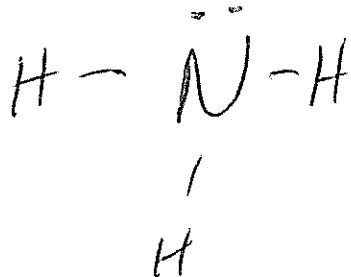
unbonded pairs = 0

Molecular Shape = linear

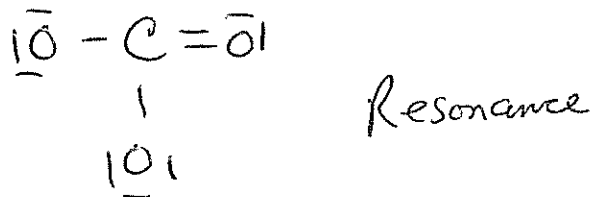
Bond Angles = —



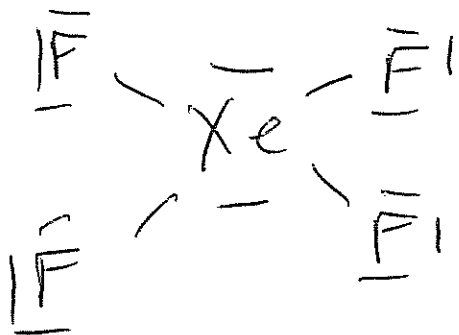
3. ammonia gas (NH₃)
 # bonded pairs = 3
 # unbonded pairs = 1
 Shape based on = tetrahedral
 Molecular Shape = Δ pyramidal
 Bond Angles = $\lt; 109.5 (107)$



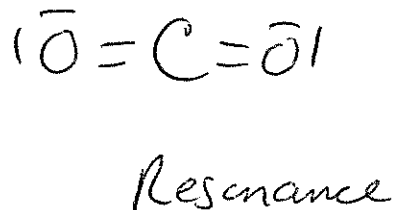
4. carbonate ion (CO₃²⁻)
 # bonded pairs = 3
 # unbonded pairs = 0
 Shape based on = Δ planar
 Molecular Shape = Δ planar
 Bond Angles = ~~120~~



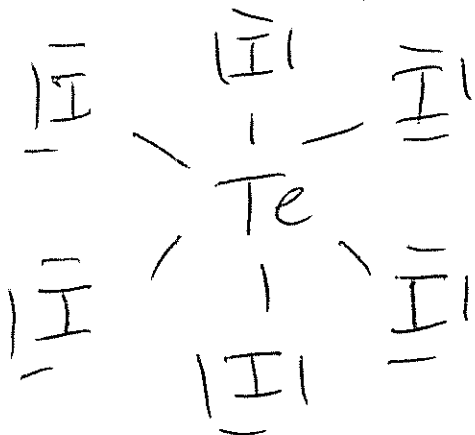
5. xenon tetrafluoride (XeF₄)
 # bonded pairs = 4
 # unbonded pairs = 2
 Shape based on = octahedral
 Molecular Shape = sq. Planar
 Bond Angles = 90°



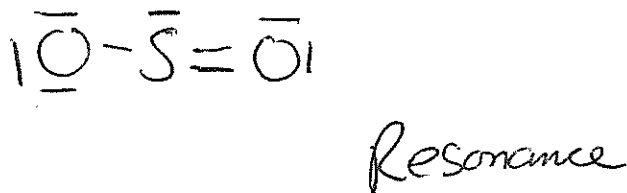
6. carbon dioxide (CO₂)
 # bonded pairs = 2
 # unbonded pairs = 0
 Shape based on = linear
 Molecular Shape = linear
 Bond Angles = 180



7. tellurium hexaiodide (TeI₆)
 # bonded pairs = 6
 # unbonded pairs = 0
 Shape based on = octah.
 Molecular Shape = octahedral
 Bond Angles = 90



8. sulfur dioxide (SO₂)
 # bonded pairs = 2
 # unbonded pairs = 1
 Shape based on = Δ planar
 Molecular Shape = bent
 Bond Angles = $\lt; 120$



Second Semester Review Part I

In the blank to the LEFT, put an (I) if the substance is ionic, a (C) if it is covalent or an (H) if it is an acid. In the blank to the RIGHT, write the correct NAME of each.

 I 1. Ca_3N_2 _____ calcium nitride _____

 C 2. PI_3 _____ phosphorus triiodide _____

 I 3. $\text{Al}_2(\text{C}_2\text{O}_4)_3$ _____ aluminum oxalate _____

 I 4. CCl_4 _____ carbon tetrachloride _____

 I 5. MnSe _____ manganese(II) selenide _____

 H 6. HNO_2 _____ hydrogen nitrite or nitrous acid _____

 C 7. Cl_2 _____ chlorine (remember it is a diatomic element)

 H 8. H_3PO_3 _____ hydrogen phosphite or phosphorous acid _____

 C 9. O_2 _____ oxygen (remember it is a diatomic element) _____

_____ 10. $\text{Al}(\text{SCN})_3$ _____ SKIP _____

 I 11. CuSO_4 _____ copper(II) sulfate _____

 H 12. H_2S _____ hydrogen sulfide or hydrosulfuric acid _____

 C 13. SBr_6 _____ sulfur hexabromide _____

 H 14. HIO_3 _____ hydrogen iodate or iodic acid _____

 I 15. Fe_3N_2 _____ iron(II) nitride _____

 I 16. Na_2SO_3 _____ sodium sulfite _____

 C 17. N_2O_4 _____ dinitrogen tetroxide _____

 H 18. H_2SO_4 _____ hydrogen sulfate or sulfuric acid _____

 I 19. $\text{Mn}(\text{ClO}_3)_3$ _____ manganese (III) chlorate _____

 H 20. HBr _____ hydrogen bromide or hydrobromic acid _____

 C 21. CO_2 _____ carbon dioxide _____

 C 22. S_2Cl_3 _____ disulfur trichloride _____

 H 23. HClO_2 _____ hydrogen chlorite or chlorous acid _____

 H 24. H_2CO_3 _____ hydrogen carbonate or carbonic acid _____

 I 25. SnCr_2O_7 _____ tin (II) dichromate _____

 C 26. Cl_2O_5 _____ dichlorine pentoxide _____

I 27. MgF_2 _____magnesium fluoride_____

I 28. CdO _____cadmium oxide_____

Write the correct chemical formula for each of the following:

$(NH_4)_2C_2O_4$ 1. Ammonium oxalate

SO_2 2. Sulfur dioxide

H_3P 3. Hydrophosphoric acid

Al_2Te_3 4. Aluminum telluride

Br_2 5. Bromine gas

S_2O_3 6. Disulfur trioxide

$Zn(OH)_2$ 7. Zinc hydroxide

HF 8. Hydrofluoric acid

CdI_2 9. Cadmium iodide

S_6Br_9 10. Hexasulfur nonabromide

see #1 11. Ammonium oxalate

CCl_4 12. Carbon tetrachloride

$KHCO_3$ 13. Potassium bicarbonate

P_2O_5 14. Triphosphorus pentoxide

HIO_3 15. Iodic acid

$HBrO_2$ 16. Bromous acid

$Cr(CH_3COO)_3$ 17. Chromium III acetate $[Cr(C_2H_3O_2)_3]^-$

N_2O 18. Dinitrogen monoxide

H_2CO_3 19. Carbonic acid

ClI_5 20. Chlorine pentaiodide

$CuCl_2$ 21. Copper II chloride

Ag_2CrO_4 22. Silver chromate

$(Hg_2)_3P_2$ 23. Mercury I phosphide

$HC_2H_3O_2$ 24. Acetic acid ($H_2C_2H_3O_2$)

HCl 25. Hydrochloric acid

O_2 26. Oxygen gas

ClO 27. Chlorine monoxide

HNO_3 28. Nitric acid

AlP 29. Aluminum phosphide

CO 30. Carbon monoxide

Study your worksheets, quizzes and tests – Balancing Equations. You must be able to write the correct chemical formulas for the reactants and products, predict the products when given only the reactants, balance the equation, and identify the type of chemical reaction that is occurring. The types of chemical reactions are:

Combination, Decomposition, Single Replacement, Double Replacement, Complete Combustion, and Incomplete Combustion.

Remember, if the equation is a single replacement reaction, you must look at the activity series to determine if the reaction can occur.