*Last semester Naming M+nonmetal

IONIC Names and Formulas WS (Sem 2 review!) Name J. Hansen Period __

		NAME these IONIC compounds
1	KNO_2	Potassium Nitrite
2	$BeNO_3$	Beryllium Nitrate
3	Sr_3P_2	Strontium phosphide
4	MgF_2	Magnesium Fluoride
5	Na_2SO_3	Sodium sulfite
6	BeI_2	Beryllium iodide
7	$KClO_3$	Potassium Chlorate
8	ZnS	Zinc sulfide
9	K_2SO_4	Potassium Sulfate
10	$CaBr_2$	Calcium Bromide
11	NiO	Nickel II oxide
12	K_2O	Potassium oxide
13	$AlPO_4$	Aluminum phosphate
14	$LiOH$	Lithium Hydroxide
15	Ba_3P_2	Barium phosphide
16	Li_2S	Lithium sulfide
17	Al_2O_3	Aluminum oxide
18	$SrSO_3$	Strontium sulfite
19	$CaCO_3$	Calcium carbonate
20	$LiNO_2$	Lithium nitrite

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NAME	*IONS AND VALENCES USED*	FORMULA
Ex. potassium sulfate	K^{+1} $[+1 \times 2 = +2]$ SO_4^{-2} $\{-2 \times 1 = -2\}$	K_2SO_4
Ex. aluminum carbonate	Al^{+3} $[+3 \times 2 = +6]$ CO_3^{-2} $\{-2 \times 3 = -6\}$	$Al_2(CO_3)_3$
1. magnesium oxide	$Mg^{+2}O^{-2}$	MgO
2. nickel III chloride	$Ni^{+3}Cl^{-1}$	$NiCl_3$
3. aluminum acetate	$Al^{+3}C_2H_3O_2^{-1}$	$Al(C_2H_3O_2)_3$
4. ammonium hydroxide	$NH_4^{+1}OH^{-1}$	NH_4OH
5. ammonium sulfate	$NH_4^{+1}SO_4^{-2}$	$(NH_4)_2SO_4$
6. beryllium iodide	$Be^{+2}I^{-1}$	BeI_2
7. zinc oxide	$Zn^{+2}O^{-2}$	ZnO
8. strontium bromide	$Sr^{+2}Br^{-1}$ I ♥ COPYING HANSEN	$SrBr_2$
9. zinc chlorite	$Zn^{+2}ClO_2^{-1}$	$Zn(ClO_2)_2$
10. aluminum chloride	$Al^{+3}Cl^{-1}$	$AlCl_3$
11. calcium sulfite	$Ca^{+2}SO_3^{-2}$	$CaSO_3$
12. aluminum chlorate	$Al^{+3}ClO_3^{-1}$	$Al(ClO_3)_3$
13. lithium carbonate	$Li^{+1}CO_3^{-2}$	Li_2CO_3
14. strontium phosphide	$Sr^{+2}P^{-3}$	Sr_3P_2
15. calcium hydroxide	$Ca^{+2}OH^{-1}$	$Ca(OH)_2$
16. magnesium nitrate	$Mg^{+2}NO_3^{-1}$	$Mg(NO_3)_2$
17. potassium nitrite	$K^{+1}NO_2^{-1}$	KNO_2
18. sodium nitride	$Na^{+1}N^{-3}$	Na_3N

2nonmetals New Naming

Writing Formulas for Covalent Compounds Name _____ Period ___ Date ___

Number	1	2	3	4	5	6	7	8	9	10
prefix	mono	di	tri	tetra	penta	hexa	hept	oct	non	dec

Write the proper formulas for these compounds (hydride is *hydrogen* sharing e- in compounds here):

1. antimony tribromide	$SbBr_3$
2. hexaboron monosilicide	B_6Si
3. sulfur dichloride	SCl_2
4. carbon tetrahydride	CH_4
5. selenium diiodide	SeI_2
6. diphosphorus trisulfide	P_2S_3
7. iodine pentafluoride	IF_5
8. nitrogen trifluoride	NF_3
9. disilicon hexabromide	Si_2Br_6
10. tricarbon octahydride	C_3H_8
11. hexacarbon decahydride	C_6H_{10}
12. dinitrogen tetroxide	N_2O_5
13. pentaiodine monobromide	I_5Br
14. heptabromine monochloride	Br_7Cl
15. oxygen hexafluoride	OF_6
16. diiodine pentasulfide	I_2S_5

Naming Covalent Compounds / prefix naming system

Ex. SN_2 Sulfur dinitride	Ex. C_7I_4 Heptacarbon tetraiodide
17. NO Nitrogen monoxide	27. I_2O_7 Diiodine heptoxide
18. N_2O_5 Dinitrogen pentoxide	28. I_2O_5 Diiodine pentaoxide
19. N_2O Dinitrogen monoxide	29. $AtCl_5$ Astatine pentachloride
20. NO_2 Nitrogen dioxide	30. I_5Cl Pentaiodine monochloride
21. P_2O_5 Dinitrogen pentaoxide	31. I_7Cl Heptaiodine monochloride
22. P_2O_3 Diphosphorus Trioxide	32. $SbCl_5$ Antimony pentachloride
23. Cl_2O_7 Dichlorine heptaoxide	33. $AsBr_3$ Arsenic Tribromide
24. Cl_2O_5 Dichlorine Pentoxide	34. Ge_3N_4 Tri Germanium Tetranitride
25. SeS Selenium ~~Sulfide~~ monosulfide	35. P_3N_5 Triphosphorus pentanitride
26. SeS_2 Selenium Disulfide	36. TeF_6 Tellurium hexafluoride

MIXED Covalent & Ionic Formulas & Names WS Name _____ Period

Covalent compounds require a nonmetal & a nonmetal. Electrons are "share".

Ionic compounds require a metal & a nonMetal. Electrons are transferred

>>>>>Write names in the top section, and formulas in the bottom section.

>>>>>>>>>Put a small C or I beside each formula to indicate a covalent or ionic compound.

***1. I NiS *Nickel II Sulfide*	11. C S_2O_4 *disulfur tetroxide*
***2. I $MnSO_4$ Manganese II sulfate	12. I $CaCl_2$ Calcium chloride
3. C F_3Cl_4 Trifluorine Tetrachloride	13. C NO Nitrogen monoxide
4. C O_2S_4 Dioxygen Tetrasulfide	14. I K_2SO_4 Potassium sulfate
*** 5. I Co_2O_3 Cobalt III oxide	15. C H_2S Dihydrogen monosulfide
***6. I $FeSO_3$ Iron II sulfite	16. I $(NH_4)_3PO_4$ Ammonium phosphate
***7 I $CoCl_2$ Cobalt II chloride	17. C As_2O_4 Diarsenic Tetraoxide
***8. I $CuNO_3$ Copper I nitrate	18. C SO_3 Sulfur trioxide
***9. I $Fe_2(CO_3)_3$ Iron III carbonate	19. I NH_4OH Ammonium Hydroxide
10. C PCl_5 Phosphorus Pentachloride	20. C SO_2 Sulfur Dioxide

21. barium hydroxide Ba^{+2} OH^{-1} $Ba(OH)_2$	30. calcium hydroxide Ca^{+2} OH^{-1} $Ca(OH)_2$
22. ammonium sulfate NH_4 (+1) SO_4 (-2) $(NH_4)_2SO_4$	31. iron II carbonate Fe^{+2} CO_3^{-2} $FeCO_3$
23. copper II sulfite Cu^{+2} SO_3^{-2} $CuSO_3$	32. ammonium chloride NH_4^{+1} Cl^{-1} NH_4Cl
24. aluminum bromide Al^{+3} Br^{-1} $AlBr_3$	33. copper II acetate Cu^{+2} $C_2H_3O_2^{-1}$ $Cu(C_2H_3O_2)_2$
25. magnesium nitrate Mg^{+2} NO_3^{-1} $Mg(NO_3)_2$	34. chromium III hydroxide $Cr(OH)_3$
26. disulfur trioxide S_2O_3	35. trisulfur tetraoxide S_3O_4
27. carbon disulfide CS_2	36. fluorine pentachloride FCl_5
28. ammonium carbonate NH_4^{+1} CO_3^{-2} $(NH_4)_2CO_3$	37. lead III sulfate Pb^{+3} SO_4^{-2} $Pb_2(SO_4)_3$
29. calcium nitrite Ca^{+2} NO_2^{-1} $Ca(NO_2)_2$	38. silicon dioxide SiO_2

Ionic VS Covalent Practice WS **Name** _____ **Period**__

Properties of Compounds

Place an "X" for the properties that each of the following compounds would possess:

Physical Property	KBr (I)	SI_2 (C)	SeO_2 (C)	P_2Cl_4 (C)	NaCl (I)	$Mg(OH)_2$ (I)
High Melting Point (Ionic)	✓				✓	✓
Low Melting Point (covalent)		✓	✓	✓		
Soluble in Water > Not rea. to know until solutions UNIT!						
Insoluble in Water						
Electrolyte (Ionic)	✓				✓	✓
Nonelectrolyte (covalent)		✓	✓	✓		
High Boiling Point (Ionic)	✓			✓	✓	✓
Low Boiling Point (covalent)		✓	✓	✓		

1. A compound is formed when electrons are transferred from one atom to another. Based on this type of bonding, what properties can you expect this element to have?

Ionic Bond – Electrolyte with high melting & boiling pts

2. A compound is formed when electrons are shared. Based on this type of bonding, what properties can you expect this element to have?

Covalent Bond – Nonelectrolyte with low melting & boiling pts

3. How would you test for electrolytes and nonelectrolytes?

Conductivity Meter

4. How would you test for solubility?

Try to dissolve salts in water.

5. How would you test boiling and melting points?

Heat compound up until it melts or boils & record temp. of occurence

Bond Type is based on how the valence electrons move

Complete the table by telling what type of bond each of the following elements would form and indicate what is happening to the valence electrons.

Type of Bond: I=ionic, C=covalent, NB=no bond
Electrons: T=transfer, S=share, NM=no movement

Compound	Type of Bond (I, C, NB?)	Electrons (T, S, NM?)
6. carbon and oxygen	Covalent	Shared
7. rubidium and bromine	Ionic	Transferred
8. hydrogen and xenon	NO Bond (B/c noble Gas)	No movement
9. titanium and cobalt	Metallic	Sea of Electrons
10. hydrogen and chlorine	Covalent	Shared
11. silver and iodine	Ionic	Transferred
12. sulfur and fluorine	Covalent	Shared

Ionic and Covalent Formula Practice (Before each name, write I or C to indicate Ionic or Covalent, then write the correct formula for each compound. Look up each ions charge!).

C 13. phosphorus tetrasulfide PS_4

I 14. aluminum carbonate $Al_2(CO_3)_3$

I 15. tin IV chloride $SnCl_4$

I 16. sodium carbonate $Na_2(CO_3)$

I 17. silver acetate $Ag(C_2H_3O_2)$

I 18. aluminum nitride AlN

I 19. nickel III chlorate $Ni(ClO_3)_3$

C 20. tetraiodine trisulfide I_4S_3

I 21. zinc carbonate $ZnCO_3$

I 22. potassium phosphate $K_3(PO_4)$

I 23. magnesium acetate $Mg(C_2H_3O_2)_2$

C 24. phosphorus pentachloride PCl_5

Ionic and Covalent Naming Practice (Before each formula, write I or C to indicate Ionic or Covalent, then write the correct formula for each compound). (*** need roman numerals)

I ***25. $CoCl_2$ Cobalt II chloride

I ***26. $CuNO_3$ Copper I nitrate

I ***27. $Fe_2(CO_3)_3$ Iron III carbonate

C 28. PCl_5 phosphorus pentachloride

I 29. Na_3P Sodium phosphide

C 30. N_2O_4 Dinitrogen tetraoxide

C 31. As_2O_4 Diarsenic Tetraoxide

C 32. SO_3 Sulfur trioxide

I 33. NH_4OH Ammonium hydroxide

C 34. SO_2 Sulfur dioxide

I 35. CaI_2 Calcium iodide

C 36. P_2O_5 Diphosphorus pentoxide

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HOW to Predict Shapes of Molecules (The short way)
Room for MORE examples under each step

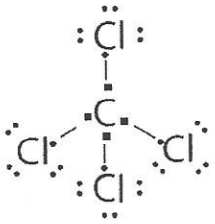
NOTES

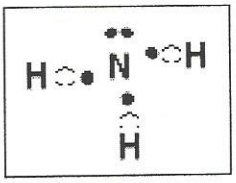
1) Draw the Lewis Dot Structure for the FIRST atom in the formula. (The FIRST atom is ALWAYS in the middle of the molecules WE draw. The number of valence electrons on the middle atom is VERY IMPORTANT to the shape of the molecule when we are done!)

2) Draw the atoms of the element that is SECOND in the formula. Draw "how many atoms" the formula says for this second element.

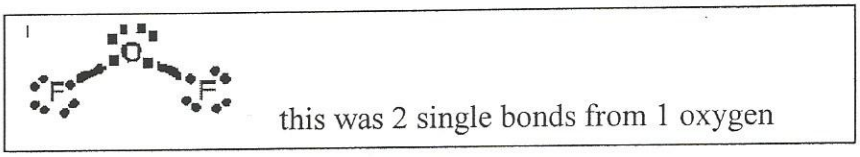
3) Here's the hard part. Draw 1 bond to connect each OUTSIDE atom electron TO THE MIDDLE ATOM until each atom has a total of 8 electrons (count its own e- and the e- from the other element). EACH electron can only have ONE line / bond touching it!

How: a. (Easiest one to see) If the middle atom has a lonely electron –not paired— AND the outer atom has a lonely electron…… then draw ONE line between them .)

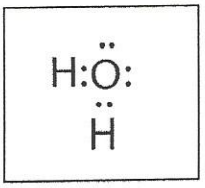




b. (harder to see how, but happens a lot too) If the **outside** atom has a lonely electron but the middle atom has only paired electrons… draw a line from the lonely electron to a specific electron in a pair on the middle atom…… The OTHER electron from that pair will have to bond with a lonely electron from a **DIFFERENT outside** electron too though!

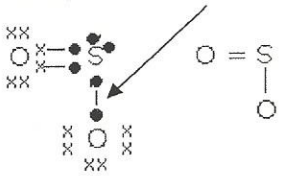


this was 2 single bonds from 1 oxygen



c. Oxygen has issues…*sometimes*

> Single bond from oxygen…. The OTHER atom must give BOTH electrons to make the bond



>> double bond from oxygen… Oxygen give 2 electrons to the double bond and the OTHER atom must give the other 2 electrons to make the bond…. Double bond made.

sulfur electrons are squares

4) LOOK at the notes page to figure out the shape. (How many total atoms are IN the formula/ molecule? Are there "lone PAIRS on the center atom" 0 pair, 1 pair or 2 pair? Which shape matches?) Practice with the examples shown!

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