

Chemical Bonding

Ionic Bond
Covalent Bond
Metallic Bond

between a Metal and Non-Metal
 between a Non-Metal and Non-Metal
 between a Metal and Metal

(M + NM)
 (NM + NM)
 (M + M)

Determine if the elements in the following compounds are metals or non-metals. Describe the type of bonding that occurs in the compound.

Compound	Element 1 (metal or non-metal?)	Element 2 (metal or non-metal?)	Bond Type	
NO ₂	N = non-metal	O = non-metal	covalent	
NaCl	M	NM	I	
SO ₂	NM	NM	C	
PO ₄ ³⁻	NM	NM	C	
MgBr ₂	M	NM	I	
CaO	M	NM	I	
H ₂ O	NM	NM	C	
K ₂ O	M	NM	I	
Cu-Zn alloy	M	M	M	
O ₂	NM	NM	C	
CuCl ₂	M	NM	I	
NO ₂ ⁻	NM	NM	C	
TiO ₂	M	NM	I	
HF	NM	NM	C	
Rb ₂ S	M	NM	I	
Au-Ag mixture	M	M	M	
Fe ₂ O ₃	M	NM	I	
C ₆ H ₁₂ O ₂₂	NM	NM	NM	C

Binary Molecular Compounds Practice



Name: _____

Date: _____

Write out the name for the following compounds.

1. P_4O_{10} tetraphosphorus decaoxide
2. $SeCl_2$ selenium dichloride
3. NO nitrogen monoxide
4. N_2O dinitrogen monoxide
5. NO_2 nitrogen dioxide
6. SF_8 sulfur octafluoride
7. BCl_3 boron trichloride
8. As_2O_5 diarsenic pentoxide
9. P_4S_5 tetraphosphorus pentasulfide
10. Si_2Br_6 disilicon hexabromide
11. SeF_6 selenium hexafluoride
12. SCl_4 sulfur tetrachloride
13. CH_4 carbon tetrahydride
14. B_2S diboron monosulfide
15. NF_3 nitrogen trifluoride

Write the formulas for the following covalent compounds:

1. antimony tribromide SbBr₃
2. hexaboron monosilicide B₆Si
3. chlorine dioxide ClO₂
4. diphosphorus monosulfide P₂S
5. iodine pentafluoride IF₅
6. dinitrogen trioxide N₂O₃
7. phosphorus triiodide PI₃
8. phosphorus trichloride PCl₃
9. arsenic pentabromide AsBr₅
10. iodine trichloride ICl₃
11. carbon monoxide CO
12. diphosphorus pentoxide P₂O₅
13. boron trifluoride BF₃
14. dichlorine heptoxide Cl₂O₇
15. carbon tetrabromide CBr₄
16. nitrogen trihydride NH₃

Naming Ionic Compounds

What are the structural units that make up ionic compounds and how are they named?

Why?

When working in chemistry, it is often convenient to write a chemical in symbols. For example we might write down the substance table salt as NaCl. In talking about chemistry however, it is a bit tacky to say "en-ay see-ell" when we want to refer to a substance. Also, in formal writing we should use the name of the compound rather than its symbols. Therefore we need to learn how to say the proper names of ionic substances.

Model 1 – Ion Charges for Selected Elements

1	H ⁺											
2	Li ⁺	Be ²⁺								N ³⁻	O ²⁻	F ¹⁻
3	Na ⁺	Mg ²⁺	Transition elements				Al ³⁺		P ³⁻	S ²⁻	Cl ¹⁻	
4	K ⁺	Ca ²⁺	Fe ²⁺ Fe ³⁺	Ni ²⁺ Ni ³⁺	Cu ⁺ Cu ²⁺	Zn ²⁺					Br ¹⁻	
5	Rb ⁺	Sr ²⁺			Ag ¹⁺			Sn ²⁺ Sn ⁴⁺			I ¹⁻	
6		Ba ²⁺				Hg ₂ ²⁺ Hg ²⁺		Pb ²⁺ Pb ⁴⁺				

← Cations

 → Anions

1. Based on the information in Model 1:

a. Identify three elements that form only one cation.

hydrogen, lithium, sodium (any that only have one charge)

b. Identify three elements that form only one anion.

fluorine, chlorine, bromine

c. Identify three elements that form more than one cation.

Iron, Nickel, Copper

d. In what region of the periodic table are these "multiple ion" elements usually located?

transition elements

2. Consider the ions of potassium (K) and sulfur (S). Write chemical formulas for all possible ionic compounds involving these ions, using the simplest ratio(s) of potassium (K) and sulfur (S). Keep in mind that the sum of the charges in an ionic compound must equal zero.

K₂S

3. Consider the ions of iron (Fe) and sulfur (S). Write chemical formulas for all possible ionic compounds involving these ions, using the simplest ratio(s) of iron (Fe) and sulfur (S). Keep in mind that the sum of the charges in an ionic compound must equal zero.

FeS and Fe₂S₃



Model 2 – Ionic Compound Names (Metals that form one ion)

NaCl	Sodium chloride	Zn ₃ P ₂	Zinc phosphide
CaS	Calcium sulfide	Al ₂ O ₃	Aluminum oxide
Ag ₂ S	Silver sulfide	SrCl ₂	Strontium chloride

4. Circle the symbol for the metal in each of the compounds in Model 2.
5. Which element comes first in the name and formula of the compounds in Model 2—the metal or the nonmetal?

metal

6. Use the table of ions in Model 1 to answer the following questions:

a. In the compound zinc phosphide, what is the charge on the zinc ion?

+2

b. In the compound zinc phosphide, what is the charge on the phosphide ion?

-3

7. Explain why a 3 to 2 ratio of ions is necessary for the compound zinc phosphide.

the sum of the charges have to equal zero

8. The compound carbon dioxide has a name that gives you a hint as to how many oxygen atoms are in the compound. Is there anything in the name “zinc phosphide” that indicates there are three zinc and two phosphorus ions in the formula unit?

No

9. Is there any other ratio of zinc and phosphorus ions that could exist? For instance, could you have Zn₂P or ZnP₂? Explain your answer.

No because Zn always has a +2 charge and P always has -3 charge

10. Explain why you don't need to specify the number of ions in the compound when you are naming ionic substances like those in Model 2.

always need to be neutral, so there is only possible combination

11. Model 2 is labeled “Metals that form one ion.” What other metals that also form only one ion could be included in the Model 2 list? Model 1 may be helpful in this regard.

Lithium, potassium, rubidium, Beryllium, magnesium, Barium

12. Describe how the names of the nonmetal elements in Model 2 are changed when they are in their anion forms.

ending changes to -ide

13. Name the following ionic compounds using what you learned from Model 2.

Li₂O
Lithium oxide

MgF₂
magnesium fluoride

Al₂S₃
aluminum sulfide

K₃N
potassium nitride

14. Provide the chemical formula for each of the following ionic compounds.

Barium chloride BaCl_2

Magnesium oxide

MgO

15. Consider the two chemical formulas you wrote in Question 3 for compounds of iron and sulfur. Would the name "iron sulfide" be sufficient to uniquely identify either of those compounds? Explain.

No because we would not be able to tell the difference between the two

Read This!

When the metal in an ionic compound always forms an ion with the same charge, you need not indicate that charge as part of the compound name. However, some atoms have the ability to form more than one type of ion. This can make naming confusing. You can't simply refer to a compound of copper and oxygen as "copper oxide." People won't know which compound you are referring to— CuO or Cu_2O .

Model 3 – Ionic Compound Names (Metals that form multiple ions)

Cu_2O Copper(I) oxide

PbO Lead(II) oxide

CuO Copper(II) oxide

PbO_2 Lead(IV) oxide

SnF_2 Tin(II) fluoride

FeCl_2 Iron(II) chloride

SnF_4 Tin(IV) fluoride

FeCl_3 Iron(III) chloride

16. Model 3 is labeled "Metals that form multiple ions." What other metals that form multiple ions could be included in Model 3? Model 1 may be helpful in this regard.

Ni , Hg .

17. Describe the most obvious difference between the names in Model 3 and those in Model 2.

Roman numerals

18. Do the Roman numerals in the names in Model 3 relate to the number of cations or number of anions in the formula unit? Support your answer by citing two specific examples.

the # of anions

Cu_2O copper(I) oxide

~~example~~ SnF_4 tin(IV) fluoride

19. Keeping in mind that the sum of the charges in an ionic compound must equal zero, use the chemical formulas in Model 3 to answer the following questions:

- a. Identify the charge on the copper cations in copper(I) oxide and copper(II) oxide, respectively.

Cu^{+1} Cu^{+2}

- b. Identify the charge on the iron cations in iron(II) chloride and iron(III) chloride, respectively.

Fe^{+2} Fe^{+3}

20. What do the Roman numerals in the compounds described in Question 19 indicate?

the charge of the cation

21. Fill in the table below using what you've learned from Model 3.

Compound	Charge on Cation	Name of the Compound
PbCl ₄	Pb ⁴⁺	Lead(IV) chloride
Fe ₂ O ₃	Fe ³⁺	Iron(III) oxide
SnO	Sn ²⁺	Tin(II) oxide
CuBr ₂	Cu ²⁺	Copper(II) bromide



22. For each of the compounds in the table below, determine the type of metal in the compound and then name the compound using the correct naming method.

	Metal forms only one ion	Metal forms multiple ions	Name
CaBr ₂	Ca	Ag	calcium bromide
MgO	Mg	Mg	magnesium oxide
Ag ₃ N	Ag	Ag	silver nitride
SnCl ₂		Sn	tin(II) chloride
CuF ₂		Cu	copper(II) fluoride
K ₃ P	K		potassium phosphide
Zn ₃ N ₂	Zn		zinc nitride
HgO		Hg	mercury(II) oxide

Name _____

Date _____ Period _____

Ionic #2 WS

Binary Compounds – containing metal with nonmetal

Name the following:

1. NaF sodium fluoride
2. K₂O potassium oxide
3. LiBr lithium bromide
4. CaCl₂ calcium chloride
5. BaS barium sulfide
6. BaF₂ barium fluoride
7. Na₂S sodium sulfide
8. MgI₂ magnesium iodide
9. K₃N potassium nitride
10. BeSe beryllium selenide

Write formulas for the following:

11. aluminum chloride AlCl₃
12. lithium sulfide Li₂S
13. calcium phosphide Ca₃P₂
14. barium fluoride BaF₂
15. potassium oxide K₂O
16. sodium bromide NaBr
17. barium nitride Ba₃N₂
18. lithium oxide Li₂O
19. aluminum oxide Al₂O₃
20. rubidium iodide RbI

Binary Compounds - containing transition metal with nonmetal

Name the following:

1. CuCl copper (I) chloride
2. CuCl₂ copper (II) chloride
3. FeO Iron (II) oxide
4. MnS manganese (II) sulfide
5. Cr₂O₃ chromium (III) oxide
6. NiF₂ Nickel (II) fluoride
7. SnCl₄ Tin (IV) chloride
8. Ag₃P silver phosphide
9. ZnS zinc sulfide
10. HgCl₂ mercury (II) chloride

Write formulas for the following:

11. mercury(II) sulfide HgS
12. copper(I) nitride Cu₃N
13. iron(III) bromide FeBr₃
14. mercury(I) oxide Hg₂O
15. silver fluoride AgF
16. copper(II) oxide CuO
17. chromium(III) iodide CrI₃
18. nickel(II) bromide NiBr₂
19. tin(IV) sulfide SnS₂
20. zinc oxide ZnO

Compounds containing polyatomic ions

Name the following:

1. BaSO₄ Barium sulfate
2. (NH₄)₂CO₃ ammonium carbonate
3. Li₂SO₃ lithium sulfite
4. CrPO₄ chromium (III) phosphate
5. NaC₂H₃O₂ sodium acetate
6. Ba(OH)₂ barium hydroxide
7. Fe(NO₃)₃ Iron (III) nitrate
8. KCN potassium cyanide
9. SrCrO₄ strontium chromate
10. CaCr₂O₇ calcium dichromate

Write formulas for the following:

11. aluminum sulfate Al₂(SO₄)₃
12. zinc nitrite Zn(NO₂)₂
13. magnesium chlorate Mg(ClO₃)₂
14. sodium bicarbonate Na₂CO₃
15. calcium hydroxide Ca(OH)₂
16. copper(II) carbonate CuCO₃
17. ammonium sulfide (NH₄)₂S
18. iron(III) acetate Fe(C₂H₃O₂)₃
19. lithium sulfite Li₂SO₃
20. strontium phosphate Sr₃(PO₄)₂

Mixed Up Ionic Compounds ☺ (M^+NM^-)

1. State the number of electrons lost or gained when these elements form ions. Be sure to specify whether the electrons are lost or gained.

a) Br 1 gained b) Cu lost c) Ca 2 lost

2. Write the formulas of the ions for these elements

a) potassium K^+ b) beryllium Be^{+2} c) sulfide S^{-2}

3. Write the formula and charge of each of the following ions.

a) ammonium NH_4^+ b) nitrate NO_3^- c) Tin (II) Sn^{+2}

4. Write formulas for compounds formed from these pairs of ions.

a) Ba^{2+} , S^{2-} BaS b) Ca^{2+} , N^{3-} Ca_3N_2

5. Write formulas for these compounds

a) sodium iodide NaI

b) potassium sulfide K_2S

c) tin (II) fluoride SnF_2

d) calcium iodide CaI_2

e) lithium hydrogen sulfate $LiHSO_4$

f) chromium(III) nitrite ~~Cr(NO_2)_3~~ $Cr(NO_2)_3$

g) barium hydroxide $Ba(OH)_2$

h) sodium bromide $NaBr$

6. Name these compounds.

a) ZnS zinc sulfide

b) BaO barium oxide

c) $NaClO_2$ sodium chlorite

d) SnO_2 Tin(IV) oxide

e) $Fe(C_2H_3O_2)_2$ Iron(II) acetate

f) K_2CrO_4 Potassium chromate

g) CaO calcium oxide

h) $Ba_3(PO_4)_2$ Barium phosphate

Compound Practice

Name: _____

Date: _____

Part 1: Label each of the following as Covalent (C) or ionic (I), and fill in the formula for each compound.

1) sodium bicarbonate	<u>I</u>	<u>NaHCO₃</u>
2) magnesium sulfate	<u>I</u>	<u>MgSO₄</u>
3) lead (IV) sulfide	<u>I</u>	<u>PbS₂</u>
4) phosphorus trichloride	<u>C</u>	<u>PCl₃</u>
5) copper (I) carbonate	<u>I</u>	<u>Cu₂CO₃</u>
6) tetraphosphorus decoxide	<u>C</u>	<u>P₄O₁₀</u>
7) calcium chloride	<u>I</u>	<u>CaCl₂</u>
8) Zinc nitrate	<u>I</u>	<u>Zn(NO₃)₂</u>
9) tin (II) iodide	<u>I</u>	<u>SnI₂</u>
10) nitrogen monoxide	<u>C</u>	<u>NO</u>
11) sodium nitrate	<u>I</u>	<u>NaNO₃</u>
12) dinitrogen tetroxide	<u>C</u>	<u>N₂O₄</u>
13) titanium (IV) oxide	<u>I</u>	<u>TiO₂</u>
14) phosphorus pentabromide	<u>C</u>	<u>PBr₅</u>
15) iron (III) selenide	<u>I</u>	<u>Fe₂Se₃</u>
16) aluminum chloride	<u>I</u>	<u>AlCl₃</u>
17) nitrogen dioxide	<u>C</u>	<u>NO₂</u>
18) carbon tetrachloride	<u>C</u>	<u>CCl₄</u>
19) cobalt (II) iodide	<u>I</u>	<u>CoI₂</u>
20) Francium phosphate	<u>I</u>	<u>Fr₃PO₄</u>
21) Lead (IV) chromate	<u>I</u>	<u>Pb(CrO₄)₂</u>
22) magnesium acetate	<u>I</u>	<u>Mg(C₂H₃O₂)₂</u>
23) silver bromide	<u>I</u>	<u>AgBr</u>
24) chromium (III) nitride	<u>I</u>	<u>CrN</u>
25) potassium acetate	<u>I</u>	<u>KC₂H₃O₂</u>

covalent (C)

Part 2: Label each of the following as molecular (M) or ionic (I), and fill in the name for each compound.

26) $\text{Al}(\text{OH})_3$	I	aluminum hydroxide
27) SrCl_2	I	strontium chloride
28) NaBr	I	sodium bromide
29) S_2Cl_2	C	disulfur dichloride
30) Li_3PO_4	I	lithium phosphate
31) $\text{Fe}_2(\text{C}_2\text{O}_4)_3$		
32) SiO_4	C	silicon tetroxide
33) HNO_2		
34) $\text{Cr}(\text{C}_2\text{H}_3\text{O}_2)_3$	I	chromium(III) acetate
35) $\text{Ni}(\text{HSO}_4)_2$	I	Nickel(II) hydrogen sulfate
36) Li_2CO_3	I	lithium carbonate
37) $\text{Cu}(\text{ClO}_4)_2$	I	copper(II) perchlorate
38) CsF	I	cesium fluoride
39) KOH	I	potassium hydroxide
40) $(\text{NH}_4)_2\text{SO}_3$	I	ammonium sulfite
41) MgSO_3	I	magnesium sulfite
42) IBr_3	C	Iodine tribromide
43) SO_3	C	sulfur trioxide
44) HgO	I	mercury(II) oxide
45) AgNO_3	I	silver nitrate
46) FeCl_2	I	Iron(II) chloride
47) $\text{Cr}_3(\text{PO}_4)_2$	I	Chromium(III) phosphate
48) CuCl_2	I	barium copper(II) chloride
49) NaNO_2	I	sodium nitrite
50) BaCO_3	I	barium carbonate

Naming Acids

What makes an acid unique and how are acids named?

Why?

A variety of acids are used in foods, industry, and research. Acids are covalently bonded molecules, but when they are put into water they produce ions. One of the ions produced is always H^+ , which immediately combines with a water molecule to form the hydronium ion (H_3O^+). The H_3O^+ ion is what defines the acidic properties of a substance. Because of their special classification, acids have a naming system different from ionic or other molecular (covalent) compounds.

Model 1 – Binary Acids

Acid	Name of acid in aqueous solution	Cation (+)*	Anion (-)
HCl	Hydrochloric acid	H_3O^+	Cl^-
HBr	Hydrobromic acid	$H_3O^+ (H^+)$	Br^-
H_2S	Hydrosulfuric acid	$2H_3O^+$	S^{2-}
HF	Hydrofluoric acid	$H_3O^+ (H^+)$	F^-

*Hydrogen ions (H^+) join with water molecules in solution to form hydronium ions, H_3O^+ .

1. Complete the cation and anion columns of the table in Model 1. Be careful to show the charges on the ions.

2. Why does hydrosulfuric acid contain two hydrogens?

because sulfur's ion has a negative 2 charge

3. Look at the formulas and names of the binary acids in Model 1.

a. What prefix is used at the beginning of the name for all binary acids?

hydro

b. What suffix is used at the end of the name for all binary acids?

ic

4. The prefix "bi" means "two." Propose a reason that the acids in Model 1 are all referred to as "binary" acids.

there are only 2 types of elements

5. Write a rule for naming binary acids.

hydro _____ ic acid



Model 2 – Ternary Acids (Oxyacids)

Acid	Name of Acid in Aqueous Solution	Cation (+)	Polyatomic Anion (-)	Polyatomic Anion Name
HClO_3	Chloric acid	H_3O^+	ClO_3^-	chlorate
H_2SO_3	Sulfurous acid	2 H_3O^+	SO_3^{2-}	sulfite
H_2SO_4	Sulfuric acid	2 H_3O^+	SO_4^{2-}	Sulfate
H_3PO_3	Phosphorous acid	3 H_3O^+	PO_3^{3-}	Phosphite
H_3PO_4	Phosphoric acid	3 H_3O^+	PO_4^{3-}	phosphate
HNO_3	Nitric acid	H_2O^+	NO_3^-	Nitrate
HNO_2	Nitrous acid	H_2O^+	NO_2^-	Nitrite
H_2CO_3	Carbonic acid	2 H_2O^+	CO_3^{2-}	carbonate

6. Look at the formulas of the ternary acids in Model 2.

a. How are ternary acids different from binary acids in their structure?

have more than 2 types of elements (contain polyatomic ions)

b. What number do you think the prefix "ter-" refers to?

of elements

7. When ternary acids are mixed with water, ions will form. Fill in the table above with the formulas and names of the anions.

8. Examine the pairs of ternary acids in Model 2 that contain sulfur, phosphorus, and nitrogen. Each pair has one acid that ends in "-ic" and another that ends in "-ous." These endings are related to the name of the polyatomic anion found in the acid ("-ate" or "-ite"). Complete the statements below with the correct acid name ending.

Polyatomic anion ending is "-ate" → acid name ending is ic.

Polyatomic anion ending is "-ite" → acid name ending is ous.

9. If the prefix "hydro-" were used to name a ternary acid, what problem would this create when naming HClO_3 ?

we couldn't tell the difference between HCl + HClO_3

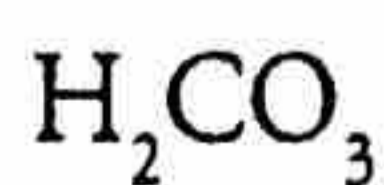
10. Write a rule for naming ternary acids.

ate → ic acid
ite → ous acid

11. Predict the formula for chlorous acid.



12. Circle the acid(s) below that would be named beginning with the prefix "hydro-."



Extension Questions

Model 3 – Halogen Oxyacid Acid Families

Acid	Name of Acid	Cation (+)	Anion (-)	Anion Name
HClO_4	Perchloric acid	H^+	ClO_4^-	Perchlorate
HClO_3	Chloric acid	H_3O^+	ClO_3^-	chlorate
HClO_2	Chlorous acid	H^+	ClO_2^-	Chlorite
HClO	Hypochlorous acid	H^+	ClO^-	hypochlorite
HBrO_4	Perbromic acid	H^+	BrO_4^-	Perbromate
HIO_3	Iodic acid	H^+	IO_3^-	iodate
HFO_2	Hypofluorous acid	H^+	FO_2^-	fluorite
HIO	hypoiodous acid	H^+	IO^-	Hypoiodite

- Write the formulas of the cations and anions for each acid in the table in Model 3.
- Consider the names of the oxyacids in Model 3 that contain chlorine. All halogens form similar oxyacids that use the same naming convention. Fill in the names of the halogen oxyacids to complete the table.
- The table below includes both binary and ternary acids. Using what you have learned in this activity, fill in the missing formula and name for the anion in each acid, and give the formula of the acid.

Acid name	Anion	Anion Name	Acid Formula
Hydroiodic acid	I^-	Iodide	HI
Chlorous acid	ClO_2^-	chlorite	HClO_2
Hypobromous acid	BrO_2^-	hypobromite	HBrO_2
Phosphoric acid	PO_4^{3-}	phosphate	H_3PO_4
Sulfurous acid	SO_3^{2-}	sulfite	H_2SO_3

Name the following acids

1. HCl hydrochloric acid
2. HClO₄ perchloric acid
3. HIO₃ iodic acid
4. HI hydroiodic acid
5. H₂SO₄ sulfuric acid
6. H₂S hydrosulfuric acid
7. HCN cyanic acid
8. H₂CO₃ carbonic acid
- ~~9. HBrO₄~~
10. HBrO₃ bromic acid
11. HC₂H₃O₂ acetic acid
- ~~12. H₃PO₃~~
13. H₃P hydrophosphoric acid
14. H₂CrO₄ chromic acid
- ~~15. H₂CrO₂~~
16. H₂Cr hydrochromic acid

Give formulas for the following acids

17. hydrofluoric acid HF
18. nitric acid HNO₃
19. nitrous acid HNO₂
- ~~20. periodic acid~~
- ~~21. percarbonic acid~~
- ~~22. hypobromous acid~~
- ~~23. bromous acid~~
24. permanganic acid HMnO₄
- ~~25. manganic acid~~
- ~~26. iodous acid~~
27. sulfurous acid H₂SO₃
28. sulfuric acid H₂SO₄
29. perchloric acid HClO₄
30. chlorous acid HClO₂
31. acetic acid HC₂H₃O₂
32. phosphoric acid H₃PO₄
- ~~33. phosphorous acid~~

Naming Acids and Bases

Name the following acids and bases:

- 1) NaOH sodium hydroxide
- 2) H₂SO₃ sulfurous acid
- 3) H₂S hydrosulfuric acid
- 4) H₃PO₄ phosphoric acid
- 5) NH₃ ammonia
- 6) HCN cyanic acid
- 7) Ca(OH)₂ calcium hydroxide
- 8) Fe(OH)₃ Iron(III) hydroxide
- 9) H₃P hydrophosphoric acid

Write the formulas of the following acids and bases:

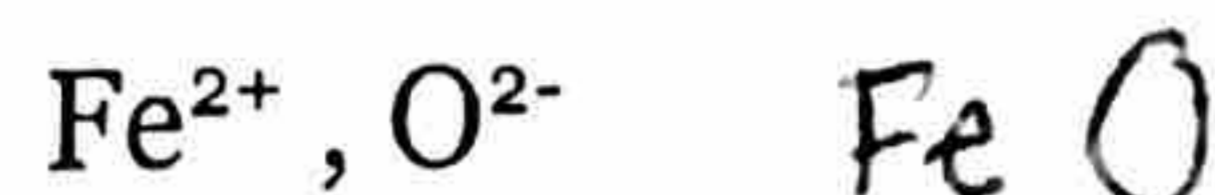
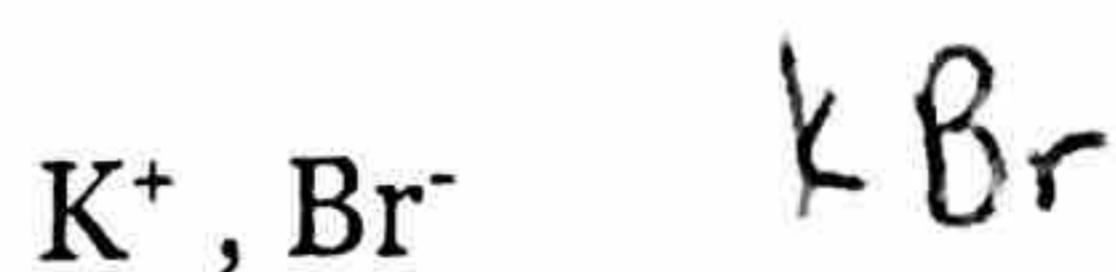
- 10) hydrofluoric acid HF
- 11) hydroselenic acid H₂Se
- 12) carbonic acid H₂CO₃
- 13) lithium hydroxide LiOH
- 14) nitrous acid HNO₂
- 15) cobalt (II) hydroxide Co(OH)₂
- 16) sulfuric acid H₂SO₄
- 17) beryllium hydroxide Be(OH)₂
- 18) hydrobromic acid HBr

Compounds Review
Honors Chemistry

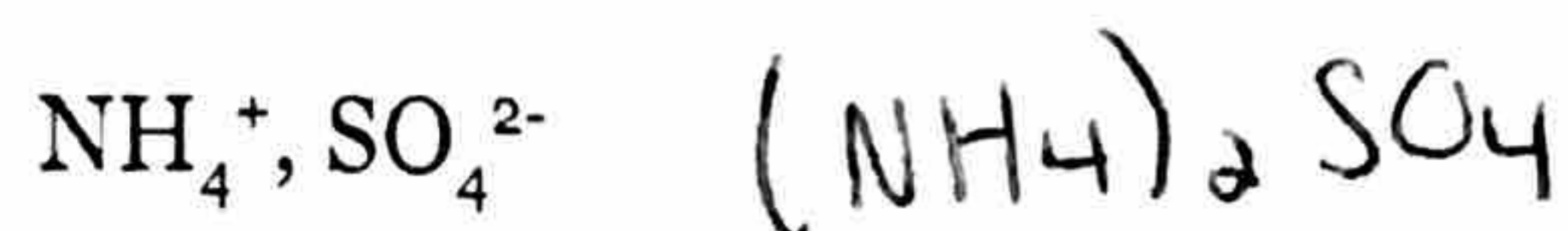
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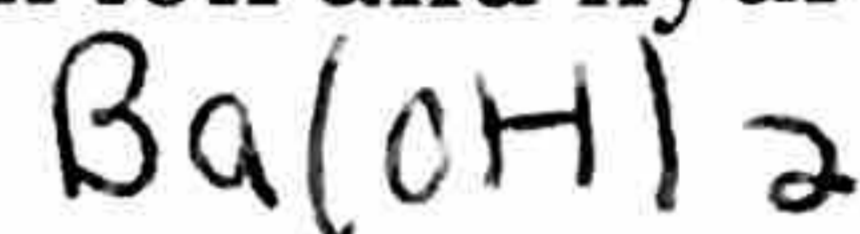
1. Write the formulas for the compounds formed from these pairs of ions.



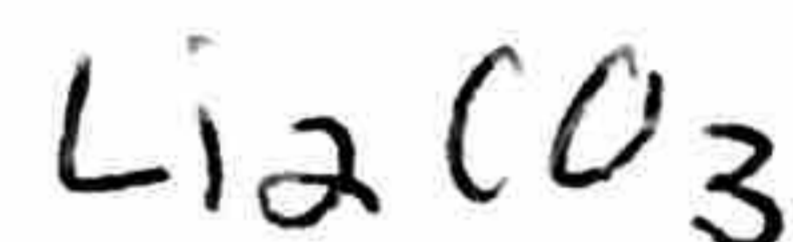
2. Write formulas for compounds formed from these pairs of ions.



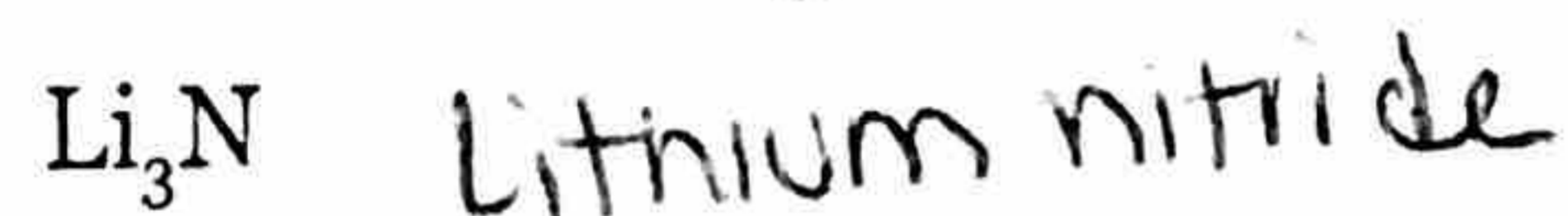
Barium ion and hydroxide ion



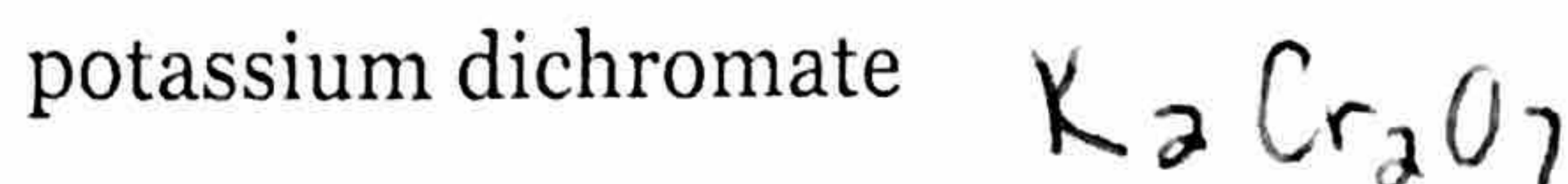
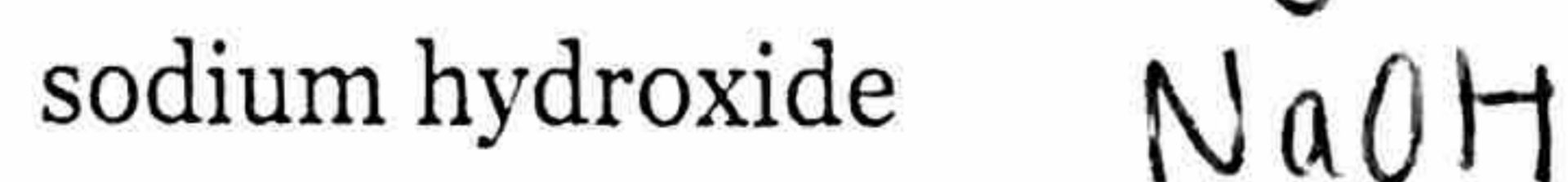
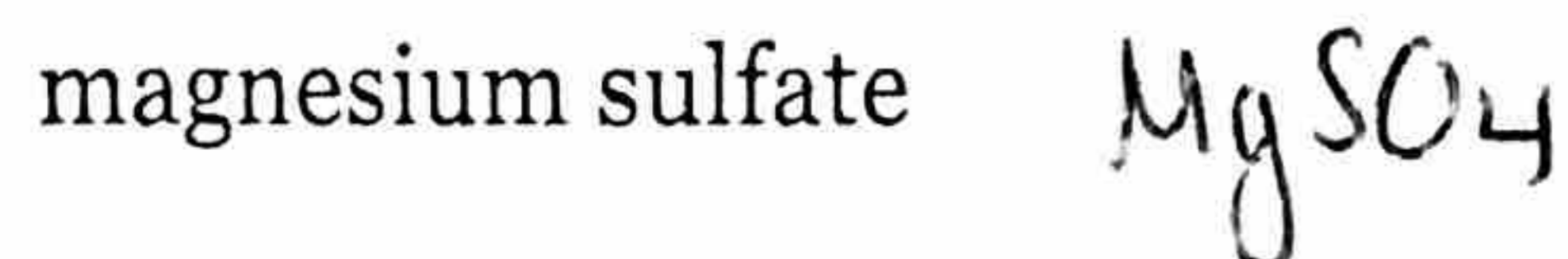
Lithium ion and carbonate ion



3. Name the following binary ionic compounds.



4. Write formulas for the following ternary ionic compounds.



5. Name the following compounds.

NaCN sodium cyanide

FeCl₃ Iron(III) chloride

Na₂SO₄ sodium sulfate

K₂CO₃ potassium carbonate

Cu(OH)₂ copper(II) hydroxide

LiNO₃ lithium nitrate

6. Name the following molecular compounds.

PCl₅ phosphorus pentachloride

CCl₄ carbon tetrachloride

NO₂ nitrogen dioxide

XeF₂ xenon difluoride

SiO₂ silicon dioxide

Cl₂O₇ dichlorine heptoxide

7. Write the formulas for the following binary molecular compounds.

nitrogen tribromide NBr₃

dichlorine monoxide Cl₂O

sulfur dioxide SO₂

dinitrogen tetrafluoride N₂F₄

8. Give the name or formula of these common acids.

HCl hydrochloric acid

H₃PO₄ phosphoric acid

Acetic acid HC₂H₃O₂

Sulfuric acid H₂SO₄

9. Write the formulas for these compounds.

aluminum sulfide Al₂S₃

tin (II) chloride SnCl₂

dihydrogen monoxide H₂O

magnesium oxide MgO

hydroiodic acid HI

ammonium fluoride NH₄F

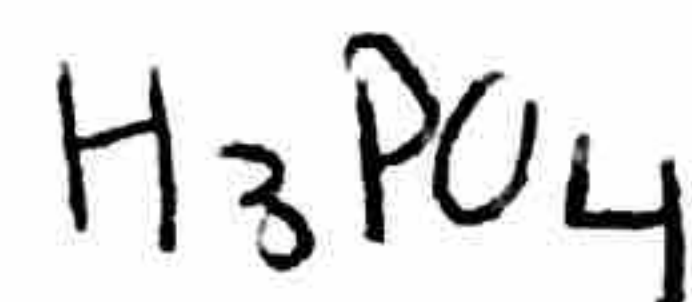
nitrogen trioxide NO₃

iron (II) phosphate Fe₃(PO₄)₂

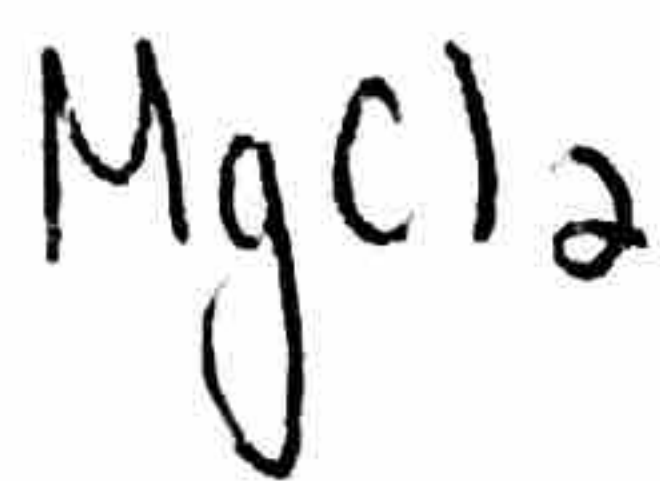
sulfur hexafluoride



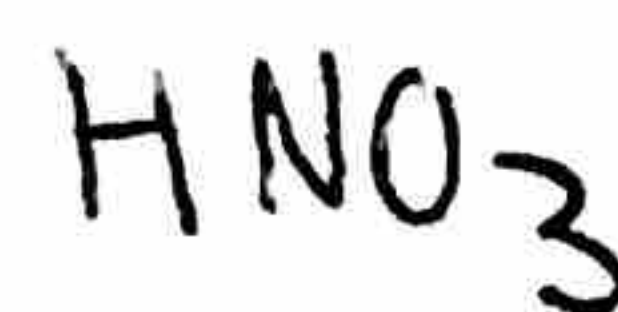
phosphoric acid



magnesium chloride



nitric acid



10. Name the following compounds.

K_3PO_4 potassium phosphate

$Al(OH)_3$ aluminum hydroxide

$NaHSO_4$ sodium hydrogen sulfate

HgO mercury(II) oxide

N_2O_5 dinitrogen pentoxide

NBr_3 nitrogen tribromide

PI_3 phosphorus triiodide

$(NH_4)_2SO_4$ ammonium sulfate