

Compound Naming Packet

Name _____ Period _____

Naming compounds (AKA, nomenclature) is a very important part of chemistry. To properly name a compound, you must know how the compound is bonded because the type of bond that forms the compound determines the naming rules you must follow. This sheet will address naming **binary ionic compounds**.

Naming Rule: *To name binary ionic compounds, you name the cation (+) first, then you name the anion (-) with an -ide ending. If the formula contains a transition metal, you must use Roman Numerals to indicate the charge of the transition metal.*

Example 1: NaCl = sodium chloride**Example 2:** FeBr₂ = Iron (II) Bromide

Name the following ionic compounds using IUPAC nomenclature rules.

- | | |
|--|--|
| 1. _____ BaCl ₂ | 21. _____ KCl |
| 2. _____ NaF | 22. _____ LiBr |
| 3. _____ MgS | 23. _____ FeCl ₃ |
| 4. _____ Al ₂ O ₃ | 24. _____ MgCl ₂ |
| 5. _____ CaI ₂ | 25. _____ NiBr ₃ |
| 6. _____ K ₂ S | 26. _____ AuCl ₃ |
| 7. _____ CaO | 27. _____ MnS |
| 8. _____ Ba ₃ P ₂ | 28. _____ K ₂ O |
| 9. _____ Na ₂ O | 29. _____ CuBr ₂ |
| 10. _____ BeS | 30. _____ CuBr |
| 11. _____ Ag ₂ O | 31. _____ CaS |
| 12. _____ CuBr | 32. _____ MgBr ₂ |
| 13. _____ CuBr ₂ | 33. _____ MgI ₂ |
| 14. _____ FeO | 34. _____ Al ₂ S ₃ |
| 15. _____ Fe ₂ O ₃ | 35. _____ NaBr |
| 16. _____ CrCl ₂ | 36. _____ SrCl ₂ |
| 17. _____ CrCl ₃ | 37. _____ Mg ₃ N ₂ |
| 18. _____ HgBr ₂ | 38. _____ BaI ₂ |
| 19. _____ MnO | 39. _____ Al ₂ O ₃ |
| 20. _____ Mn ₂ O ₃ | 40. _____ CdBr ₂ |

41. _____ Ag_3N 61. _____ CsBr
42. _____ MgF_2 62. _____ Na_2O
43. _____ ZnO 63. _____ LiCl
44. _____ Ag_2S 64. _____ Al_2S_3
45. _____ Ba_3N_2 65. _____ MgF_2
46. _____ MgF_2 66. _____ NaI
47. _____ LiF 67. _____ K_2O
48. _____ AlP 68. _____ AgF
49. _____ BaS 69. _____ Sr_3N_2
50. _____ Ag_2O 70. _____ CdS
51. _____ CdCl_2 71. _____ ZnBr_2
52. _____ Li_3N 72. _____ AlF_3
53. _____ ZnF_2 73. _____ Cu_3P_2
54. _____ CsCl 74. _____ MgS
55. _____ KF 75. _____ HgO
56. _____ CsF 76. _____ CoBr_2
57. _____ Li_3P 77. _____ Rb_3P
58. _____ NaF 78. _____ K_2Se
59. _____ K_2S 79. _____ Fe_2Se
60. _____ CdI_2 80. _____ Ag_2S

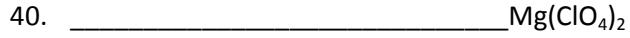
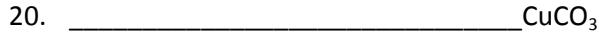
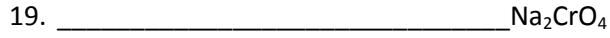
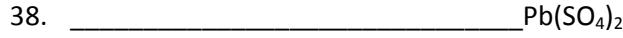
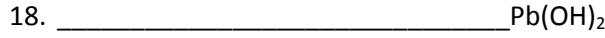
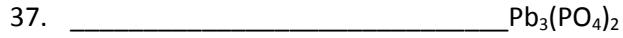
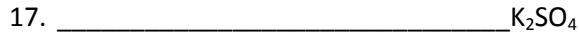
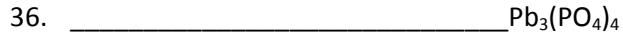
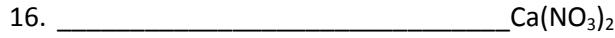
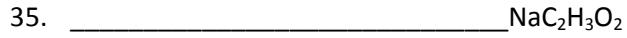
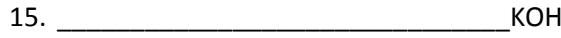
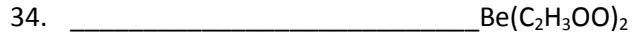
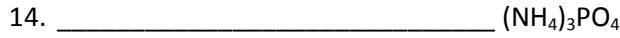
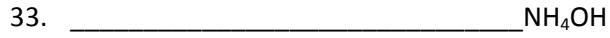
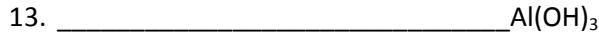
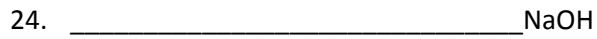
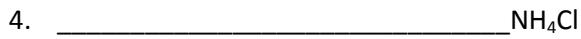
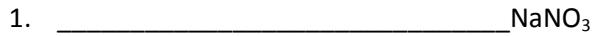
Naming Ternary Formulas (AKA Ionic Formulas with a Polyatomic Ion)

To name a ternary formula containing a polyatomic ion, you name the cation (+) first and the anion (-) second. If you have a polyatomic ion, you DO NOT change it to an -ide ending. If the polyatomic is the cation (+) and the anion (-) is a monatomic ion, you can still add the -ide ending. *If the formula contains a transition metal, you must use Roman Numerals to indicate the charge of the transition metal.*

Example 1: Li₂Cr₂O₇ = Lithium dichromate

Example 2: (NH₄)₂O = Ammonium oxide

Name the following ionic compounds using IUPAC nomenclature rules.



41. _____ $\text{Al}(\text{ClO}_3)_3$ 61. _____ $\text{Cu}(\text{ClO}_4)_2$
42. _____ $\text{Ga}(\text{NO}_2)_3$ 62. _____ HgCrO_4
43. _____ Cs_2SO_3 63. _____ $\text{Ba}(\text{OH})_2$
44. _____ $(\text{NH}_4)_2\text{CO}_3$ 64. _____ $\text{Al}(\text{ClO}_3)_3$
45. _____ $\text{Pb}(\text{HCO}_3)_2$ 65. _____ $\text{Mg}_3(\text{PO}_4)_2$
46. _____ $\text{Ga}(\text{NO}_3)_3$ 66. _____ $\text{Pb}(\text{SO}_4)_2$
47. _____ CaSO_4 67. _____ $(\text{NH}_4)_2\text{CrO}_4$
48. _____ $\text{Ag}_3(\text{PO}_4)_2$ 68. _____ $\text{Zn}(\text{HCO}_3)_2$
49. _____ Ag_3PO_4 69. _____ $\text{K}_2\text{Cr}_2\text{O}_7$
50. _____ $\text{Fe}(\text{C}_2\text{H}_3\text{O}_2)_3$ 70. _____ $\text{Pb}(\text{Cr}_2\text{O}_7)_2$
51. _____ $\text{Ba}(\text{HCO}_3)_2$ 71. _____ $(\text{NH}_4)_2\text{CO}_3$
52. _____ $\text{Cr}(\text{HCO}_3)_2$ 72. _____ $\text{Al}(\text{OH})_3$
53. _____ CuCr_2O_7 73. _____ $\text{Ca}(\text{MnO}_4)_2$
54. _____ $\text{Zn}(\text{CN})_2$ 74. _____ $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$
55. _____ $\text{Hg}_3(\text{PO}_4)_2$ 75. _____ KHCO_3
56. _____ $\text{Fe}(\text{C}_2\text{H}_3\text{O}_2)_2$ 76. _____ $\text{Sr}(\text{NO}_2)_2$
57. _____ Cu_2CO_3 77. _____ $\text{Ag}(\text{OH})_2$
58. _____ $\text{Sn}(\text{OH})_2$ 78. _____ $(\text{NH}_4)_2\text{SO}_3$
59. _____ $\text{Sr}(\text{NO}_3)_2$ 79. _____ $\text{Mn}(\text{ClO}_4)_2$
60. _____ $\text{Fe}(\text{HCO}_3)_2$ 80. _____ CsClO_3

Naming Covalent Compounds

Remember that covalent compounds contain nonmetals bonded with other nonmetals. A covalent compound can also be called a molecule. When naming molecules, you use a Greek prefix to indicate the number of each type of atom present in the compound. You also add an –ide to the end of the second element in the compound. You DO NOT need the mono-prefix before the first element. Also, you can alter the spelling to avoid putting two vowels together.

An example of this rule: CO = carbon monoxide, not carbon monooxide.

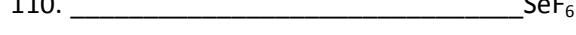
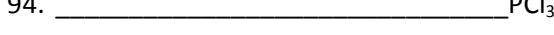
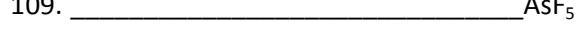
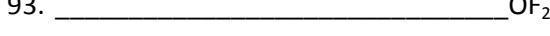
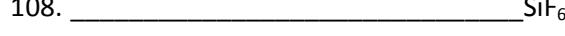
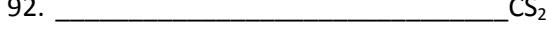
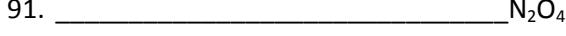
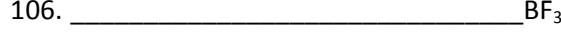
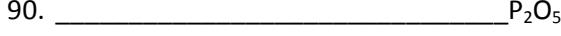
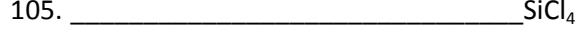
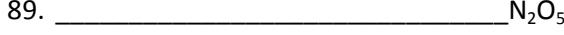
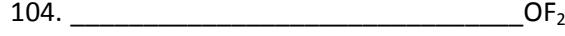
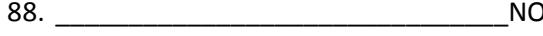
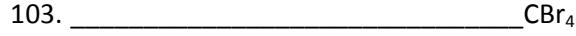
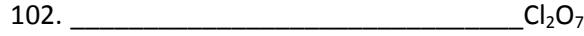
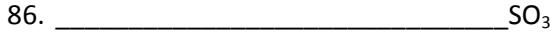
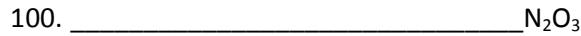
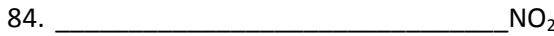
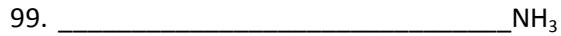
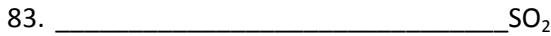
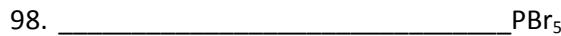
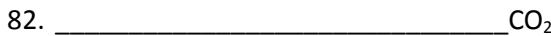
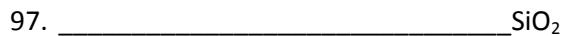
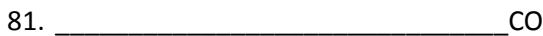
Greek Prefixes

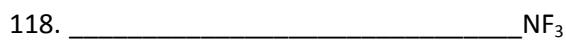
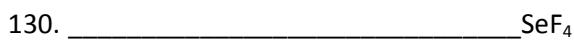
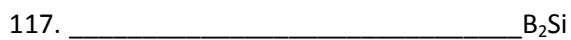
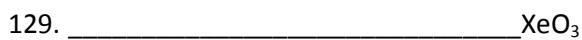
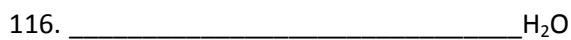
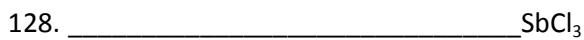
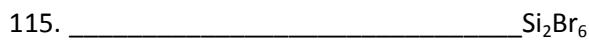
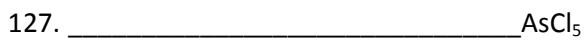
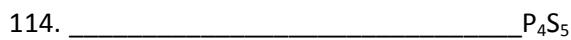
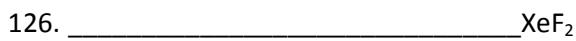
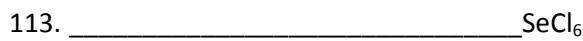
Mono - 1	Hexa - 6
Di - 2	Hepta - 7
Tri - 3	Octa - 8
Tetra - 4	Nona - 9
Penta - 5	Deca - 10

Example 1: CO = carbon monoxide

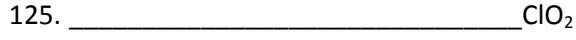
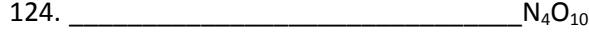
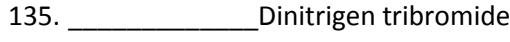
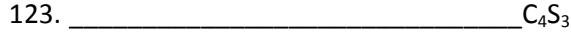
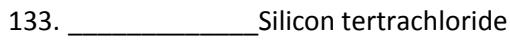
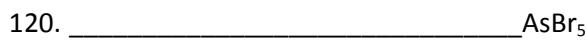
Example 2: N₂O dinitrogen monoxide

Name the following covalent compounds using IUPAC nomenclature rules.





Write the formula for the named compound.



Naming Acids

Acids are a special chemical that chemically behave a certain way. They typically begin with a hydrogen (H). The rules for naming the acid depend on if there is an oxygen in the acid.

Nooxyacids do not contain an oxygen and you name them with a **hydro-** prefix and change the **-ide** suffix with **-ic**.

Example: HCl = hydrochloric acid

Oxyacids are names based on the polyatomic ion which it was formed from.

Ions that end in -ate, replace -ate with -ic acid

Example: H^+ , NO_3^- = HNO_3 = Hydrogen nitrate = Nitric acid

Ions that end in -ite, replace -ite with -ous acid

Example: H^+ , NO_2^- = HNO_2 = Hydrogen nitrite = Nitrous acid

Ions that are per_____ate, replace -ate with per_____ic acid.

Example: H^+ , ClO_4^- = HClO_4 = Hydrogen Perchlorate = Perchloric acid

Ions that are hypo_____ite, replace -ite with hypo_____ous acid.

Example: H^+ , ClO^- = HClO = Hydrogen hypochlorite = Hypochlorous acid

Name the following acids using IUPAC nomenclature rules.

136. _____ HNO_3

Write the formulas of the following acids

137. _____ HCl

148. _____ Sulfuric acid

138. _____ HF

149. _____ Nitric acid

139. _____ H_2SO_4

150. _____ Hydrochloric acid

140. _____ H_2SO_3

151. _____ Acetic acid

141. _____ $\text{HC}_2\text{H}_3\text{O}_2$

152. _____ Hydrofluoric acid

142. _____ HBr

153. _____ Phosphorus acid

143. _____ HI

154. _____ Carbonic acid

144. _____ HNO_2

155. _____ Nitrous acid

145. _____ H_3PO_4

156. _____ Phosphoric acid

146. _____ H_2S

157. _____ Hydrosulfuric acid

147. _____ H_2CO_3

Mixed Practice

The following compounds are a mixture of binary ionic compounds, ternary ionic compounds w/ polyatomic ions, covalent compounds, and acids. Name the following compounds using IUPAC nomenclature rules.

It is helpful to determine what type of compound it is first, so you can name it following the correct nomenclature rules.

- 1) Identify the compound type: "I-2" for binary ionic, "I-3" for ternary ionic, "C" for covalent, and "A" for acids.
- 2) Then name the compound using IUPAC nomenclature rules.

Type	Name
1. _____	N_2O_2
2. _____	$\text{Ba}_3(\text{PO}_4)_2$
3. _____	SrBr_2
4. _____	BrF_3
5. _____	HClO_3
6. _____	$\text{Ag}(\text{NO}_3)_2$
7. _____	AgNO_3
8. _____	SiBr_4
9. _____	HNO_3
10. _____	NH_4CN
11. _____	CaF_2
12. _____	$\text{Mn}_3(\text{PO}_4)_2$
13. _____	H_2SO_4
14. _____	Cs_3PO_4
15. _____	$\text{HC}_2\text{H}_3\text{O}_2$
16. _____	H_2SO_3
17. _____	CO_2
18. _____	SH_8
19. _____	CBr_4
20. _____	ZnO