

CHEM 160 – Binary Molecular Nomenclature

Rules for Binary Molecular Compounds	Prefixes
<p>The naming system is for compounds composed of two nonmetallic elements.</p> <p>1. The first element keeps its name. The first element gets a prefix <i>if it has a subscript in the formula</i>.</p> <p>2. The second element gets the “-ide” suffix (ending) and it <i>always gets a prefix!</i></p>	<p>1- mono 2- bi 3- tri 4- tetra 5- penta 6- hexa</p>

Compound Name	Compound Formula
carbon dioxide	
carbon monoxide	
diphosphorus pentoxide	
dinitrogen monoxide	
silicon dioxide	
carbon tetrabromide	
sulfur dioxide	
phosphorus pentabromide	
iodine trichloride	
nitrogen triiodide	
dinitrogen trioxide	

Compound Formula	Compound Name
N ₂ O ₄	
SO ₃	
NO	
NO ₂	
As ₂ O ₅	
PCl ₃	
CCl ₄	
H ₂ O	
SeF ₆	

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Type I Binary Compounds contain Group I, II, and III metals with nonmetal ions.

Ionic compounds \Rightarrow **no** prefixes in names!

Give the correct names for the type I binary compounds:

KCl	MgO
K ₂ O	AlCl ₃
CaO	BaS
MgCl ₂	Al ₂ S ₃
NaH	SrF ₂
ZnS	MgI ₂
RbBr	CaSe
Al ₂ O ₃	BaBr ₂
Na ₃ N	CsCl
Ca ₂ C	Mg ₃ P ₂
KI	CaCl ₂

Give the correct formulas for the type I binary compounds:

calcium iodide	magnesium phosphide
calcium hydride	sodium chloride
magnesium fluoride	barium oxide
cadmium bromide	aluminum arsenide
sodium nitride	calcium sulfide
rubidium oxide	potassium selenide
barium nitride	sodium iodide
lithium chloride	lithium sulfide
silver sulfide	calcium carbide
aluminum nitride	sodium hydride
cesium fluoride	magnesium nitride

Write the correct name for: *metal(Roman numeral) nonmetal*

1. CuS – (Cu²⁺ and S²⁻) \Rightarrow copper(II) sulfide
2. PbBr₄
3. Pb₃N₂
4. Fe₂O₃
5. FeI₂

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6. Sn_3P_4
7. Cu_2S
8. SnCl_2
9. HgO
10. Hg_2F_2
11. CuCl_2
12. CuBr
13. PbO
14. Fe_2S_3
15. PbCl_2
16. SnO
17. Cu_2O
18. PbO_2
19. FeO
20. SnO_2
21. Hg_2O
22. Hg_2I_2
23. AuCl_3
24. MnO
25. CrCl_3
26. CoO
27. Mn_2O_3
28. Co_2S_3
29. AuF
30. CrBr_2

Metal(Roman Numeral) Nonmetal

Write the correct formula for:

1. iron(II) chloride
2. copper(I) sulfide

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3. lead(IV) iodide
4. tin(II) fluoride
5. mercury(I) bromide
6. tin(II) oxide
7. chromium(III) oxide
8. gold(I) iodide
9. manganese(II) nitride
10. cobalt(III) phosphide
11. iron(III) chloride
12. copper(II) sulfide
13. lead(II) bromide
14. tin(IV) iodide
15. mercury(II) fluoride
16. tin(IV) oxide
17. manganese(II) chloride
18. chromium(II) nitride
19. gold(III) oxide
20. cobalt(II) phosphide
21. tin(II) sulfide
22. mercury(I) sulfide
23. gold(III) bromide
24. manganese(II) chloride
25. chromium(II) chloride
26. lead(IV) nitride
27. cobalt(III) oxide
28. copper(II) iodide
29. tin(IV) fluoride
30. iron(II) phosphide

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Inorganic Nomenclature Worksheet

1. ammonium sulfide
2. sodium nitrate
3. aluminum sulfate
4. potassium nitrate
5. lead(II) phosphate
6. diphosphorus pentoxide
7. calcium fluoride
8. nickel nitrate
9. silver cyanide
10. zinc sulfate
11. tin(II) chloride
12. antimony(III) chloride
13. silver sulfide
14. magnesium hydroxide
15. ammonium carbonate
16. nickel acetate
17. sodium chromate
18. potassium permanganate
19. potassium phosphate
20. nickel iodide
21. hydrogen iodide
22. magnesium nitrate
23. iron(III) chromate
24. iron(II) chromate
25. copper(II) hydroxide
26. calcium chlorate
27. ammonium oxide
28. zinc bicarbonate
29. sodium phosphate

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30. ammonium phosphate
31. potassium sulfide
32. tin(IV) bromide
33. lithium chromate
34. magnesium bisulfate
35. aluminum acetate
36. barium chromate
37. potassium hydroxide
38. silver phosphate
39. ammonium chromate
40. barium carbonate
41. calcium iodide
42. zinc phosphate
43. silver oxide
44. nickel bromide
45. magnesium oxide
46. oxygen difluoride
47. cobalt(II) hydrogen sulfate
48. acetic acid
49. ammonium hydroxide
50. cobalt(II) iodide
51. chromium(II) bicarbonate
52. sodium hydroxide
53. silver nitrate
54. mercury(II) nitrate
55. hydrochloric acid
56. cobalt(III) hydrogen sulfate
57. phosphorus pentabromide
58. sodium acetate
59. silver bicarbonate

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60. potassium iodide
61. potassium dichromate
62. magnesium carbonate
63. calcium bicarbonate
64. aluminum hydroxide
65. ammonium chromate
66. nitrogen triiodide
67. ammonium dichromate
68. iron(III) chromate
69. zinc sulfate
70. boron monophosphide
71. nitric acid
72. calcium sulfide
73. copper(I) bisulfate
74. zinc permanganate
75. hydrobromic acid
76. hydrocyanic acid
77. hydrogen cyanide
78. sulfuric acid
79. copper(I) sulfate
80. chromium(III) oxide
81. aluminum oxide
82. barium carbonate
83. lead(II) oxide

Write the correct formula or name:

1. HgF_2
2. KCl
3. KMnO_4
4. ZnO

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5. $\text{Ba}(\text{OH})_2$
6. NH_4MnO_4
7. CaCO_3
8. $\text{Ba}_3(\text{PO}_4)_2$
9. Fe_2O_3
10. CoF_3
11. H_2CO_3
12. K_2SO_4
13. NaHSO_4
14. PF_5
15. Ag_2O
16. Cu_2CrO_4
17. $\text{HC}_2\text{H}_3\text{O}_2$
18. LiI
19. $\text{Al}_2(\text{SO}_4)_3$
20. HBr
21. CrCl_3
22. H_3PO_4
23. LiMnO_4
24. $\text{Fe}_2(\text{HPO}_4)_3$
25. Na_2CO_3
26. $\text{Mg}(\text{HCO}_3)_2$
27. $\text{Sn}_3(\text{PO}_4)_4$
28. HNO_3
29. ZnCl_2
30. NaH_2PO_4
31. Hg_2Cl_2
32. $\text{Sn}(\text{HCO}_3)_4$
33. NaMnO_4
34. KF

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35. CaSO_4
36. HCl
37. SbCl_3
38. NH_4Cl
39. NH_4NO_3
40. IF_5
41. NaHCO_3
42. Ba(OH)_2
43. FeCl_3
44. HF
45. PbSO_4
46. KrF_2
47. NaCl
48. P_2O_5
49. AlBr_3
50. $\text{Ba(NO}_3)_2$
51. BrF_5
52. P_4O_6
53. FePO_4
54. Hg_2SO_4
55. KH
56. N_2O_3
57. N_2O
58. $\text{Sn}_3(\text{PO}_4)_2$
59. H_2O_2
60. Be(OH)_2
61. $\text{Sr(HCO}_3)_2$
62. Sr(OH)_2
63. P_4S_{10}
64. Hg_2O_2

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65. $\text{Hg}_2(\text{OH})_2$
66. NH_4F
67. XeF_6
68. $\text{K}_2\text{Cr}_2\text{O}_7$
69. NH_4OH
70. $(\text{NH}_4)_3\text{PO}_4$
71. N_2O_5
72. SnCrO_4
73. Al_2O_3
74. CuCO_3
75. ClO_2
76. CuS
77. MgI_2
78. CoCl_3
79. NaCN
80. Hg_3N_2
81. BrO_3
82. SiF_4
83. Sb_2O_5
84. LiH
85. SF_6
86. SnI_4
87. KOH
88. K_2O
89. H_2SO_4
90. lithium oxide
91. xenon trioxide
92. gold(I) chloride
93. gold(I) cyanide
94. sodium oxide

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95. potassium chlorate
96. nickel(II) fluoride
97. potassium cyanide
98. manganese dioxide
99. osmium tetrachloride
100. rubidium carbonate
101. trisulfur dinitride
102. nitrogen trichloride
103. vanadium(V) oxide
104. selenium tetrafluoride
105. XeF_4
106. $\text{Hg}(\text{OH})_2$
107. CaH_2
108. As_4O_6
109. BN
110. CoS
111. N_2O_4
112. H_3BO_3
113. I_2O_5
114. PbO
115. NaBr
116. Li_2CrO_4
117. ICl
118. SO_3
119. Hg_2O
120. NaH
121. OsO_4
122. XeF_2
123. $\text{Ca}(\text{C}_2\text{H}_3\text{O}_2)_2$
124. Na $\text{C}_2\text{H}_3\text{O}_2$

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- 125. $\text{Al}(\text{OH})_3$
- 126. Li_2HPO_4
- 127. $\text{Ca}(\text{NO}_3)_2$
- 128. $\text{Mn}(\text{NO}_3)_2$
- 129. $\text{Au}(\text{H}_2\text{PO}_4)_3$
- 130. $\text{Al}(\text{MnO}_4)_3$
- 131. $(\text{NH}_4)_3\text{PO}_4$
- 132. $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$
- 133. $\text{Ba}(\text{BrO}_3)_2$
- 134. AuCl_3
- 135. Al_2S_3
- 136. Na_2HPO_4
- 137. $\text{Mg}_3(\text{PO}_4)_2$
- 138. $\text{KAl}(\text{C}_2\text{O}_4)_2$
- 139. $\text{Cr}_2(\text{SO}_3)_3$
- 140. $\text{Mn}(\text{IO}_3)_2$
- 141. KBrO_3
- 142. $\text{Fe}(\text{ClO}_4)_3$
- 143. $\text{Cr}(\text{OH})_3$

Acid Nomenclature Worksheet - “-ate” \Leftrightarrow “-ic acid”

“-ide” \Leftrightarrow “hydro___ic acid”

Write the formula for each of the acids listed below:

nitric acid	
chloric acid	
hydrobomic acid	
phosphoric acid	
hydrofluoric acid	
hydroiodic acid	
carbonic acid	
sulfuric acid	

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Name each of the following acids:

H_3PO_4	
HCl (aq)	
H_2SO_4	
HI (aq)	
$\text{HC}_2\text{H}_3\text{O}_2$	
HF	
HClO_3	
H_2CO_3	
HNO_3	
HBr (aq)	