

Chemical Formula Writing Worksheet

Determine the chemical formula for each cation and anion combination. Write your answers in each box.

Set 1 (The combining power of silver is 1 and zinc is 2)

Anions - Cations +	chloride	oxide	iodide	hydride	sulfide	nitride
Sodium						
Potassium						
Magnesium						
Calcium						
Copper(II)						
Iron(II)						
Iron(III)						
Silver						
Zinc						
Aluminum						

Set 2

Anions - Cations +	bromide	oxide	fluoride	astatide	selenide	phosphide
Lithium						
Barium						
Cesium						
Strontium						
Copper(I)						
Copper(II)						
Lead(II)						
Lead(IV)						
Gallium						
Nickel(II)						

Chemical Formula Writing Worksheet

Determine the chemical formula for each cation and anion combination. Write your answers in each box.

Brackets are only needed when the polyatomic group is greater than 1. Eg. Strontium phosphate, $\text{Sr}_3(\text{PO}_4)_2$

Set 3 (The combining power of silver is 1 and zinc is 2. The formula for the ammonium ion is NH_4^+)

Cations \ Anions	-	nitrate	sulfate	hydroxide	carbonate	phosphate	hydrogen carbonate
	+	NO_3^-	SO_4^{2-}	OH^-	CO_3^{2-}	PO_4^{3-}	HCO_3^-
Sodium							
Potassium							
Magnesium							
Barium							
Iron(II)							
Iron(III)							
Silver							
Zinc							
Aluminum							
Ammonium							

Set 4 (The combining power of silver is 1 and zinc is 2. The formula for the ammonium ion is NH_4^+)

Cations \ Anions	-	nitrite	chromate	sulfite,	dichromate	chlorate	acetate*
	+	NO_2^-	CrO_4^{2-}	SO_3^{2-}	$\text{Cr}_2\text{O}_7^{2-}$	ClO_3^-	CH_3COO^-
Lithium							
Mercury(I)							
Tin(II)							
Silver							
Iron(II)							
Iron(III)							
Barium							
Zinc							
Aluminum							
Ammonium							

*The acetate group, CH_3COO^- is written first as this correctly shows the position of the ionic bond. Eg. $\text{CH}_3\text{COO}^-\text{Na}^+$

Naming Compounds (Ionic & Covalent)

Naming Ionic Compounds (salts)

1. Write the full name of the first element or the positive ion (cation).
2. Write the root of the second element or the negative ion (anion).
 - a. Examples: The root of Fluorine is Fluor-, the root of Chlorine is Chlor-
3. Replace the ending of the negative ion (anion) name with the suffix -ide

Ionic Compound Chemical Formula	Ionic Compound Name
Al^{3+} and $\text{Br}^- \rightarrow \text{AlBr}_3$	
Be^{2+} and $\text{O}^{2-} \rightarrow \text{BeO}$	
K^+ and $\text{N}^{3-} \rightarrow \text{K}_3\text{N}$	
Ba^{2+} and $(\text{CrO}_4)^{2-} \rightarrow \text{Ba}(\text{CrO}_4)$	
Cs^+ and $\text{F}^- \rightarrow \text{CsF}$	
$(\text{NH}_4)^+$ and $\text{S}^{2-} \rightarrow (\text{NH}_4)_2\text{S}$	
Mg^{2+} and $\text{Cl}^- \rightarrow \text{MgCl}_2$	
B^{3+} and $\text{I}^- \rightarrow \text{BI}_3$	
Na^+ and $(\text{SO}_4)^{2-} \rightarrow \text{Na}_2(\text{SO}_4)$	
Si^{4+} and $(\text{C}_2\text{H}_3\text{O}_2)^- \rightarrow \text{Si}(\text{C}_2\text{H}_3\text{O}_2)_4$	
Mg^{2+} and $\text{N}^{3-} \rightarrow \text{Mg}_3\text{N}_2$	
Ca^{2+} and $\text{Cl}^- \rightarrow \text{CaCl}_2$	
Ca^{2+} and $(\text{CO}_3)^{2-} \rightarrow \text{Ca}(\text{CO}_3)$	
$(\text{NH}_4)^+$ and $(\text{OH})^- \rightarrow (\text{NH}_4)(\text{OH})$	
Sr^{2+} and $\text{Br}^- \rightarrow \text{SrBr}_2$	
Be^{2+} and $(\text{MnO}_4)^- \rightarrow \text{Be}(\text{MnO}_4)_2$	
Mg^{2+} and $\text{Cl}^- \rightarrow \text{MgCl}_2$	
K^+ and $(\text{PO}_4)^{3-} \rightarrow \text{K}_3(\text{PO}_4)$	

Polyatomic Ion Names:

Ammonium: $(\text{NH}_4)^+$ Acetate: $(\text{C}_2\text{H}_3\text{O}_2)^-$ Hydroxide: $(\text{OH})^-$ Permanganate: $(\text{MnO}_4)^-$ Phosphate: $(\text{PO}_4)^{3-}$ Sulfate: $(\text{SO}_4)^{2-}$
Carbonate: $(\text{CO}_3)^{2-}$ Chromate: $(\text{CrO}_4)^{2-}$ Ammonia: $(\text{NH}_3)^+$ Sulfite: $(\text{SO}_3)^{2-}$

Naming Covalent Compounds

- Write the full name of the first element in the chemical formula.
 - Add a prefix to the first name if there are two or more atoms as indicated in the chemical formula.
- Write the root of the name of the second element in the chemical formula.
 - Add the suffix -ide.
 - Add a prefix to the name indicating the number of atoms present in the chemical formula.
- Prefixes are: 1 = mono, 2 = di, 3 = tri, 4 = tetra, 5 = penta, 6 = hexa, 7 = hepta, 8 = octa, 9 = nona, 10 = deca

Write the Names for the Following Covalent Compounds

- | | |
|---------------------|---------------------|
| 1. P_4S_5 _____ | 11. C_6H_6 _____ |
| 2. CO_2 _____ | 12. PF_6 _____ |
| 3. SeF_6 _____ | 13. BF_3 _____ |
| 4. Si_2Br_6 _____ | 14. P_2O_4 _____ |
| 5. SCl_4 _____ | 15. S_2Cl_3 _____ |
| 6. CH_4 _____ | 16. NO_2 _____ |
| 7. B_2Si _____ | 17. OF_2 _____ |
| 8. NF_3 _____ | 18. CO _____ |
| 9. N_2O_5 _____ | 19. BrO_3 _____ |
| 10. $SeBr_6$ _____ | 20. CBr_4 _____ |

Write the Formulas for the Following Covalent Compounds

- | | |
|--------------------------------|-------------------------------------|
| 1. Antimony Tribromide _____ | 11. Dinitrogen Monoxide _____ |
| 2. Hexaboron Silicide _____ | 12. Tetraphosphorus Decaoxide _____ |
| 3. Chlorine Dioxide _____ | 13. Selenium Trioxide _____ |
| 4. Hydrogen Iodide _____ | 14. Iodine Heptafluoride _____ |
| 5. Iodine Pentafluoride _____ | 15. Sulfur Hexafluoride _____ |
| 6. Dinitrogen Trioxide _____ | 16. Sulfur Dichloride _____ |
| 7. Phosphorus Triiodide _____ | 17. Disilicon Hexabromide _____ |
| 8. Dihydrogen monoxide _____ | 18. Dichlorine Heptaoxide _____ |
| 9. Phosphorus Trihydride _____ | 19. Pentaphosphorus Decoxide _____ |
| 10. Carbon Tetrachloride _____ | 20. Arsenic Tribromide _____ |