

## Naming Chemical Compounds

### Naming Simple Binary Compounds

Name each of the following simple binary compounds.

- |                             |                     |                             |                    |
|-----------------------------|---------------------|-----------------------------|--------------------|
| 1. $\text{Na}_2\text{O}$    | sodium oxide        | 11. $\text{Na}_2\text{S}$   | sodium sulfide     |
| 2. $\text{Li}_2\text{O}$    | lithium oxide       | 12. $\text{KI}$             | potassium iodide   |
| 3. $\text{SrO}$             | strontium oxide     | 13. $\text{CaO}$            | calcium oxide      |
| 4. $\text{Al}_2\text{O}_3$  | aluminum oxide      | 14. $\text{BeI}_2$          | beryllium iodide   |
| 5. $\text{NaCl}$            | sodium chloride     | 15. $\text{AlCl}_3$         | aluminum chloride  |
| 6. $\text{MgS}$             | magnesium sulfide   | 16. $\text{AlP}$            | aluminum phosphide |
| 7. $\text{CaBr}_2$          | calcium bromide     | 17. $\text{LiBr}$           | lithium bromide    |
| 8. $\text{K}_3\text{P}$     | potassium phosphide | 18. $\text{Rb}_3\text{N}$   | rubidium nitride   |
| 9. $\text{RbCl}$            | rubidium chloride   | 19. $\text{RbF}$            | rubidium fluoride  |
| 10. $\text{Sr}_3\text{P}_2$ | strontium phosphide | 20. $\text{Al}_2\text{P}_3$ | aluminum phosphide |

### Creating Simple Binary Formulas

Write formulas for each of the following simple binary compounds.

- |                        |                         |                        |                         |
|------------------------|-------------------------|------------------------|-------------------------|
| 1. Lithium sulphide    | $\text{Li}_2\text{S}$   | 11. Hydrogen nitride   | $\text{H}_3\text{N}$    |
| 2. Potassium bromide   | $\text{KBr}$            | 12. Potassium chloride | $\text{KCl}$            |
| 3. Cesium iodide       | $\text{CsI}$            | 13. Lithium nitride    | $\text{Li}_3\text{N}$   |
| 4. Calcium phosphide   | $\text{Ca}_3\text{P}_2$ | 14. Beryllium oxide    | $\text{BeO}$            |
| 5. Sodium fluoride     | $\text{NaF}$            | 15. Sodium iodide      | $\text{NaI}$            |
| 6. Strontium oxide     | $\text{SrO}$            | 16. Magnesium oxide    | $\text{MgO}$            |
| 7. Beryllium sulphide  | $\text{BeS}$            | 17. Potassium chloride | $\text{KCl}$            |
| 8. Magnesium bromide   | $\text{MgBr}_2$         | 18. Calcium sulphide   | $\text{CaS}$            |
| 9. Lithium oxide       | $\text{Li}_2\text{O}$   | 19. Rubidium oxide     | $\text{Rb}_2\text{O}$   |
| 10. Strontium chloride | $\text{SrCl}_2$         | 20. Strontium nitride  | $\text{Sr}_3\text{N}_2$ |

### Writing Names for Compounds with Polyatomic Ions

Write the chemical formula using the given ions.

- |  |                                    |  |                                       |
|--|------------------------------------|--|---------------------------------------|
| 1. $\text{NH}_4^+$ and $\text{PO}_4^{3-}$            | $(\text{NH}_4)_3\text{PO}_4$       | 11. $\text{Ca}^{2+}$ and $\text{SO}_4^{2-}$          | $\text{CaSO}_4$                       |
| 2. $\text{H}^+$ and $\text{BO}_3^{3-}$               | $\text{H}_3\text{BO}_3$            | 12. $\text{Sr}^{2+}$ and $\text{CO}_3^{2-}$          | $\text{SrCO}_3$                       |
| 3. $\text{Li}^+$ and $\text{CO}_3^{2-}$              | $\text{Li}_2\text{CO}_3$           | 13. $\text{Ba}^{2+}$ and $\text{BO}_3^{3-}$          | $\text{Ba}_3(\text{BO}_3)_2$          |
| 4. $\text{Na}^+$ and $\text{SO}_4^{2-}$              | $\text{Na}_2\text{SO}_4$           | 14. $\text{B}^{3+}$ and $\text{PO}_4^{3-}$           | $\text{BPO}_4$                        |
| 5. $\text{K}^+$ and $\text{CrO}_4^{2-}$              | $\text{K}_2\text{CrO}_4$           | 15. $\text{NH}_4^+$ and $\text{HPO}_4^{2-}$          | $(\text{NH}_4)_2\text{HPO}_4$         |
| 6. $\text{Rb}^+$ and $\text{Cr}_2\text{O}_7^{2-}$    | $\text{Rb}_2\text{Cr}_2\text{O}_7$ | 16. $\text{H}^+$ and $\text{Cr}_2\text{O}_7^{2-}$    | $\text{H}_2\text{Cr}_2\text{O}_7$     |
| 7. $\text{Cs}^+$ and $\text{HPO}_4^{2-}$             | $\text{Cs}_2\text{HPO}_4$          | 17. $\text{Rb}^+$ and $\text{CO}_3^{2-}$             | $\text{Rb}_2\text{CO}_3$              |
| 8. $\text{Be}^{2+}$ and $\text{Cr}_2\text{O}_7^{2-}$ | $\text{BeCr}_2\text{O}_7$          | 18. $\text{Ca}^{2+}$ and $\text{HPO}_4^{2-}$         | $\text{CaHPO}_4$                      |
| 9. $\text{Mg}^{2+}$ and $\text{CrO}_4^{2-}$          | $\text{MgCrO}_4$                   | 19. $\text{B}^{3+}$ and $\text{Cr}_2\text{O}_7^{2-}$ | $\text{B}_2(\text{Cr}_2\text{O}_7)_3$ |
| 10. $\text{B}^{3+}$ and $\text{HPO}_4^{2-}$          | $\text{Be}_2(\text{HPO}_4)_3$      | 20. $\text{Be}^{2+}$ and $\text{BO}_3^{3-}$          | $\text{Be}_3(\text{BO}_3)_2$          |

### Writing Chemical Formulas for Compounds with Polyatomic Ions

Write the chemical formula for each of the following ionic compounds.

- |                                  |                                   |                                   |                           |
|----------------------------------|-----------------------------------|-----------------------------------|---------------------------|
| 1. Ammonium borate               | $(\text{NH}_4)_3\text{BO}_3$      | 8. Hydrogen phosphate             | $\text{H}_3\text{PO}_4$   |
| 2. Potassium phosphate           | $\text{K}_3\text{PO}_4$           | 9. Cesium borate                  | $\text{Cs}_3\text{BO}_3$  |
| 3. Beryllium sulphate            | $\text{BeSO}_4$                   | 10. Sodium carbonate              | $\text{Na}_2\text{CO}_3$  |
| 4. Hydrogen chromate             | $\text{H}_2\text{CrO}_4$          | 11. Strontium dichromate          | $\text{SrCr}_2\text{O}_7$ |
| 5. Sodium monohydrogen phosphate | $\text{Na}_2\text{HPO}_4$         | 12. Barium monohydrogen phosphate | $\text{BaHPO}_4$          |
| 6. Boron chromate                | $\text{B}_2(\text{CrO}_4)_3$      | 13. Barium chromate               | $\text{BaCrO}_4$          |
| 7. Potassium dichromate          | $\text{K}_2\text{Cr}_2\text{O}_7$ | 14. Lithium sulphate              | $\text{Li}_2\text{SO}_4$  |

Naming Chemical Compounds with Polyatomic Ions  
Name each of the following ionic compounds.

- $(\text{NH}_4)_2\text{CO}_3$  ammonium carbonate
- $\text{Rb}_2\text{HPO}_4$  rubidium monohydrogen phosphate
- $\text{Li}_2\text{Cr}_2\text{O}_7$  lithium dichromate
- $\text{MgHPO}_4$  magnesium monohydrogen phosphate
- $\text{SrHPO}_4$  strontium monohydrogen phosphate
- $\text{Na}_3\text{BO}_3$  sodium borate
- $\text{H}_2\text{SO}_4$  hydrogen sulfate
- $\text{Sr}_3(\text{PO}_4)_2$  strontium phosphate
- $\text{Rb}_3\text{PO}_4$  rubidium phosphate
- $\text{Rb}_2\text{CrO}_4$  rubidium chromate
- $\text{MgCr}_2\text{O}_7$  magnesium dichromate
- $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$  ammonium dichromate
- $\text{Cs}_2\text{CO}_3$  cesium carbonate
- $\text{Ca}_3(\text{BO}_3)_2$  calcium borate
- $\text{SrCrO}_4$  strontium chlorate
- $\text{B}_2(\text{CO}_3)_3$  boron carbonate

Writing Formulas for Compounds with Polyatomic Ions  
Write the chemical formula for the following ionic compounds.

- Ammonium cyanide  $\text{NH}_4\text{CN}$
- Potassium nitrate  $\text{KNO}_3$
- Beryllium hydroxide  $\text{Be}(\text{OH})_2$
- Cesium permanganate  $\text{CsMnO}_4$
- Boron iodate  $\text{B}(\text{IO}_3)_3$
- Sodium bicarbonate  $\text{NaHCO}_3$
- Rubidium dihydrogen phosphate  $\text{RbH}_2\text{PO}_4$
- Ammonium hydroxide  $\text{NH}_4\text{OH}$
- Sodium chlorate  $\text{NaClO}_3$
- Rubidium iodate  $\text{RbIO}_3$
- Potassium permanganate  $\text{KMnO}_4$
- Cesium bicarbonate  $\text{CsHCO}_3$
- Sodium hydroxide  $\text{NaOH}$
- Hydrogen cyanide  $\text{HCN}$
- Barium bisulphate  $\text{Ba}(\text{HSO}_4)_2$
- Cesium nitrate  $\text{CsNO}_3$
- Magnesium permanganate  $\text{Mg}(\text{MnO}_4)_2$
- Calcium cyanide  $\text{Ca}(\text{CN})_2$

Naming Compounds with Polyatomic Ions  
Name each of the following ionic compounds.

- |   |  |
|---|--|
| 1. HOH hydrogen hydroxide                           | 11. $\text{LiHCO}_3$ lithium bicarbonate                             |
| 2. LiCN lithium cyanide                             | 12. $\text{KHSO}_4$ potassium sulfate                                |
| 3. $\text{RbNO}_3$ rubidium nitrate                 | 13. $\text{CsIO}_3$ cesium iodate                                    |
| 4. $\text{Be}(\text{ClO}_3)_2$ beryllium chlorate   | 14. $\text{NH}_4\text{H}_2\text{PO}_4$ ammonium dihydrogen phosphate |
| 5. $\text{Ca}(\text{MnO}_4)_2$ calcium permanganate | 15. $\text{RbOH}$ rubidium hydroxide                                 |
| 6. $\text{HCH}_3\text{COO}$ hydrogen acetate        | 16. $\text{Be}(\text{CN})_2$ beryllium cyanide                       |
| 7. $\text{NH}_4\text{HCO}_3$ ammonium bicarbonate   | 17. $\text{Ca}(\text{NO}_3)_2$ calcium nitrate                       |
| 8. $\text{Ba}(\text{IO}_3)_2$ barium iodate         | 18. $\text{KClO}_3$ potassium chlorate                               |
| 9. $\text{Mg}(\text{HSO}_4)_2$ magnesium sulfate    | 19. $\text{CsCH}_3\text{COO}$ cesium acetate                         |
| 10. $\text{Sr}(\text{NO}_3)_2$ strontium nitrate    | 20. $\text{KHCO}_3$ potassium bicarbonate                            |

Creating Formulas for the Transition Metals

Name each of the following ionic compounds using Roman Numerals where necessary.

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|--|---|
| 1. $\text{ScCl}_3$ scandium chloride                 | 11. $\text{PtO}_2$ platinum(IV) oxide                                       |
| 2. $\text{Cr}(\text{NO}_3)_6$ chromium(VI) nitrate   | 12. $\text{Zn}_3\text{P}_2$ zinc phosphide                                  |
| 3. $\text{MnO}$ manganese(II) oxide                  | 13. $\text{Sn}(\text{HSO}_4)_4$ tin(IV) bisulfate                           |
| 4. $\text{Fe}(\text{MnO}_4)_2$ iron(II) permanganate | 14. $\text{Au}_2\text{O}_3$ gold(III) oxide                                 |
| 5. $\text{CoF}_3$ cobalt(III) fluoride               | 15. $\text{Bi}_3(\text{BO}_3)_5$ bismuth(V) borate                          |
| 6. $\text{Ni}_3(\text{PO}_4)_2$ nickel(II) phosphate | 16. $\text{NiN}$ nickel(II) nitride   |
| 7. $\text{CuCl}_2$ copper(II) chloride               | 17. $\text{TiO}_2$ titanium(IV) oxide                                       |
| 8. $\text{ZnO}$ zinc oxide                           | 18. $\text{VSO}_4$ vanadium(II) sulfate                                     |
| 9. $\text{GeS}_2$ germanium sulfide                  | 19. $\text{Cr}(\text{H}_2\text{PO}_4)_3$ chromium(III) dihydrogen phosphate |
| 10. $\text{AgCl}$ silver chloride                    | 20. $\text{W}(\text{MnO}_4)_4$ tungsten(IV) permanganate                    |

Writing Formulas for Compounds with Transition Metals  
Write the chemical formula for each of the following ionic compounds.

1. Chromium (II) sulphate  $\text{CrSO}_4$
2. Manganese (IV) phosphide  $\text{Mn}_3\text{P}_4$
3. Iron (III) sulphide  $\text{Fe}_2\text{S}_3$
4. Cobalt (II) dichromate  $\text{CoCr}_2\text{O}_7$
5. Nickel (III) nitride  $\text{Ni}_2\text{N}_3$
6. Copper (I) cyanide  $\text{CuCN}$
7. Zinc carbonate  $\text{ZnCO}_3$
8. Cadmium phosphate  $\text{Cd}_3(\text{PO}_4)_2$
9. Mercury (II) iodide  $\text{HgI}_2$
10. Gold (III) permanganate  $\text{Au}(\text{MnO}_4)_3$

Creating Formulas for Binary Molecular Compounds  
Write the chemical formula for each of the following molecular compounds.

1. Carbon dioxide  $\text{CO}_2$
2. Bromine monoxide  $\text{BrO}$
3. Iodine monochloride  $\text{ICl}$
4. Antimony trifluoride  $\text{SbF}_3$
5. Bromine dioxide  $\text{BrO}_2$
6. Carbon monosulphide  $\text{CS}$
7. Phosphorus tribromide  $\text{PBr}_3$
8. Dinitrogen tetraoxide  $\text{N}_2\text{O}_4$
9. Chlorine trifluoride  $\text{ClF}_3$
10. Phosphorus pentachloride  $\text{PCl}_5$
11. Bromine monofluoride  $\text{BrF}$
12. Dinitrogen pentoxide  $\text{N}_2\text{O}_5$
13. Carbon tetraiodide  $\text{CI}_4$
14. Tellurium dioxide  $\text{TeO}_2$

### Naming Binary Molecular Compounds

Write the name for each of the following molecular compounds.

1.  $\text{SiC}$  silicon monocrbide
2.  $\text{SiO}_2$  silicon dioxide
3.  $\text{SbBr}_3$  antimony tribromide
4.  $\text{IBr}$  iodine monobromide
5.  $\text{SiCl}_4$  silicon tetrachloride
6.  $\text{N}_2\text{O}$  dinitrogen monoxide
7.  $\text{CSe}_2$  carbon diselenide
8.  $\text{CS}_2$  carbon disulfide
9.  $\text{CO}$  carbon monoxide
10.  $\text{BrF}_5$  bromine pentafluoride
11.  $\text{SbCl}_3$  antimony trichloride
12.  $\text{IF}_5$  iodine pentafluoride
13.  $\text{SO}_2$  sulfur dioxide