

# 50 Ways to Name Your Compound

All of the compounds that you will be asked to name consist of two parts...

| Part 1                                 | Part 2                      | Example   |                                       | Rule  |
|--|-----------------------------|---|---------------------------------------|---|
| Metal (single valent)<br>(or ammonium) | Non-metal                   | NaCl,   | sodium chloride                       | Name both parts, ends in -ide   |
|  | Polyatomic ion              | CaCO <sub>3</sub>   | calcium carbonate                     | Name both parts   |
| Metal (multivalent)<br><br>(Latin/old) | Non-metal                   | CuCl,   | copper(I) chloride                    | Name both parts, ends in -ide, add valence after metal                                  |
|  | Polyatomic ion              | Fe <sub>2</sub> (CO <sub>3</sub> ) <sub>3</sub>           | iron(III) carbonate                   | Name both parts, add valence after metal  |
|  | Non-metal or Polyatomic ion | Fe <sub>2</sub> (CO <sub>3</sub> ) <sub>3</sub> ,<br>CuCl | ferric carbonate,<br>cuprous chloride | Metal has Latin name (ic for higher valence, ous for lower)                             |
| Non-metal                              | Non-metal                   | CO <sub>2</sub>   | carbon dioxide                        | Use Greek prefix system (mono- not used for 1 <sup>st</sup> element)                    |
| Hydrogen                               | Non-metal                   | HCl   | hydrogen chloride                     | If not aqueous, name hydrogen and non-metal (ending in -ide)                            |
|  |                             | HCl(aq)   | hydrochloric acid                     | If aqueous, "hydro" + non-metal + "ic acid"   |
| Hydrogen                               | Polyatomic ion              | H <sub>2</sub> SO <sub>4</sub>                            | sulphuric acid                        | Name polyatomic ion (ending is -ic instead of -ate or -ous instead of -ite), add "acid" |

Note: no special naming is given for bases. These are considered as a metal + polyatomic ion (OH<sup>-</sup> being a polyatomic ion)

*Assignment: write the corresponding name or formula for each of the following*

- lead(II) sulfide  $Pb_2S_2 \rightarrow PbS$
- perchloric acid  $HClO_4$
- hydrogen fluoride  $HF$
- zinc hydroxide  $Zn(OH)_2$
- hydrobromic acid  $HBr$
- $SF_6(l)$  sulfur hexafluoride
- $HNO_2(aq)$  nitrous acid
- $HCl(g)$  hydrogen chloride
- $PbCl_2$  lead II chloride
- $ZnSO_4$  zinc sulfate
- ammonium carbonate  $(NH_4)_2CO_3$
- chromium(III) sulfite  $Cr_2(SO_3)_3$
- nickel(II) sulfate hexahydrate  $NiSO_4 \cdot 6H_2O$
- hydrosulfuric acid  $H_2S$
- sulfur trioxide  $SO_3$
- $H_2CrO_4$  hydrogen chromate
- $Al_2O_3$  aluminum oxide
- $N_2O_3$  dinitrogen trioxide
- $H_2SO_3$  hydrogen sulfite
- $HgO(aq)$  mercury(II) oxide
- iron(II) nitride  $Fe_3N_2$
- tetraphosphorus decaoxide  $P_4O_{10}$
- copper(I) oxide  $Cu_2O$
- hypochlorous acid  $HClO$
- potassium peroxide  $K_2O_2$
- $CuSO_3$  copper(II) sulfite
- CO carbon monoxide
- MgS magnesium sulfide
- $KClO_2$  potassium chlorite
- $HI(aq)$  hydroiodic acid
- nitrogen trichloride  $NCl_3$
- plumbic carbonate  $Pb_2(CO_3)_4$
- potassium hydrogen sulfite  $KHSO_3$
- boric acid  $H_3BO_3$   
Borate  $BO_3^{3-}$
- barium sulfite  $Ba_2(SO_3)_2 \rightarrow BaSO_3$
- $SnCl_2$  tin(II) chloride
- $CaHPO_3(s)$  calcium hydrogen phosphite
- $H_2S(g)$  dihydrogen sulfide
- $Li_2O_2$  lithium oxide  $\rightarrow$  lithium peroxide
- $Mn(NO_2)_2$  manganese(II) nitrite
- mercuric phosphate  $(Hg_3PO_4)_2$
- sodium hydrogen carbonate  $NaHCO_3$
- copper(I) hydrogen sulfate  $CuHSO_4$
- carbon tetrachloride  $CCl_4$
- ammonium phosphate  $(NH_4)_3PO_4$
- $SO_2(aq)$  sulfur dioxide
- $MgSO_4 \cdot 9H_2O$  magnesium sulfate nonahydrate
- $HC_2H_3O_2$  hydrogen acetate
- $P_2O_3$  diphosphorous trioxide
- $H_3PO_3$  hydrogen phosphite

Given the chemical name, provide the chemical formula.

Given the chemical formula, provide the name.

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1. calcium chloride  $\text{Ca}^{2+} \text{Cl}^-$   $\text{CaCl}_2$
2. sodium oxalate  $\text{Na}^+ (\text{C}_2\text{O}_4)^{2-}$   $\text{Na}_2\text{C}_2\text{O}_4$
3. hydrogen sulfide  $\text{H}^+ \text{S}^{2-}$   $\text{H}_2\text{S}$
4. strontium sulfate  $\text{Sr}^{2+} \text{SO}_4^{2-}$   $\text{SrSO}_4$
5. potassium permanganate  $\text{K}^+ \text{MnO}_4^-$   $\text{KMnO}_4$
6. oxygen difluoride  $\text{OF}_2$
7. diphosphorous pentoxide  $\text{P}_2\text{O}_5$
8. copper (II) phosphide  $\text{Cu}^{2+} \text{P}^{3-}$   $\text{Cu}_3\text{P}_2$
- ~~9.~~ nitrous oxide  $\text{N}_2\text{O}$
10. nickel (IV) nitrate  $\text{Ni}^{4+} \text{NO}_3^-$   $\text{Ni}(\text{NO}_3)_4$
11. lead (II) dichromate  $\text{Pb}^{2+} (\text{Cr}_2\text{O}_7)^{2-}$   $\text{PbCr}_2\text{O}_7$
12. ammonium sulfite  $\text{NH}_4^+ (\text{SO}_3)^{2-}$   $(\text{NH}_4)_2\text{SO}_3$
13. zinc acetate  $\text{Zn}^{2+} (\text{C}_2\text{H}_3\text{O}_2)^-$   $\text{Zn}(\text{C}_2\text{H}_3\text{O}_2)_2$
14. hydrosulfuric acid  $\text{H}^+ \text{S}^{2-}$   $\text{H}_2\text{S}$
15. sodium dihydrogen phosphate  $\text{Na}^+ \text{H}_2\text{PO}_4^-$   $\text{NaH}_2\text{PO}_4$
16. magnesium hydroxide  $\text{Mg}^{2+} \text{OH}^-$   $\text{Mg}(\text{OH})_2$
17. manganese (IV) oxide  $\text{Mn}^{4+} \text{O}^{2-}$   $\text{MnO}_2$
18. ammonium sulfate  $\text{NH}_4^+ \text{SO}_4^{2-}$   $(\text{NH}_4)_2\text{SO}_4$
19. gold (I) carbonate  $\text{Au}^+ (\text{CO}_3)^{2-}$   $\text{Au}_2\text{CO}_3$
20. chromium (III) cyanide  $\text{Cr}^{3+} \text{CN}^-$   $\text{Cr}(\text{CN})_3$
- ~~21.~~ cyclohexane  $\text{C}_6\text{H}_{12}$
22. cadmium perchlorate  $\text{Cd}^{2+} (\text{ClO}_4)^-$   $\text{Cd}(\text{ClO}_4)_2$
23. ammonia  $\text{NH}_3$
24. copper (I) sulfide  $\text{Cu}^+ \text{S}^{2-}$   $\text{Cu}_2\text{S}$
25. titanium (II) phosphate  $\text{Ti}^{2+} (\text{PO}_4)^{3-}$   $\text{Ti}_3(\text{PO}_4)_2$

26.  $\text{CCl}_4$  Carbon tetrachloride
27.  $\text{NO}$  nitrogen monoxide
28.  $\text{Na}_2\text{SO}_3$  Sodium sulfite
29.  $\text{FeCl}_2$  iron(II) chloride
- ~~30.~~  $\text{CH}_3(\text{CH}_2)_5\text{CH}_3$  heptane
31.  $\text{Mg}(\text{ClO}_3)_2$  magnesium chlorate
32.  $\text{KClO}_2$  potassium chlorite
33.  $\text{NH}_4\text{HSO}_4$  ammonium bisulfate or ammonium hydrogen sulfate
34.  $\text{Ag}_2\text{CO}_3$  silver carbonate
35.  $\text{K}_3\text{N}$  potassium nitride
36.  $\text{CaBr}_2$  calcium bromide
37.  $\text{BaSO}_4$  barium sulfate
38.  $\text{H}_2\text{C}_2\text{O}_4(\text{aq})$  oxalic acid
- ~~39.~~  $\text{Hg}_2\text{Cl}_2$  mercury chloride
40.  $\text{Li}_2\text{HPO}_4$  lithium hydrogen phosphate
41.  $\text{P}_4\text{H}_{10}$  tetraphosphorus decahydride
42.  $\text{HNO}_2(\text{aq})$  nitrous acid
43.  $\text{C}_3\text{H}_6$  tricarbon hexahydride
44.  $\text{CaH}_2$  calcium hydride
45.  $\text{Zn}(\text{HCO}_3)_2$  zinc hydrogen carbonate or zinc bicarbonate
46.  $\text{BF}_3$  boron fluoride
47.  $\text{SiO}_2$  silicon oxide
48.  $\text{FeCr}_2\text{O}_7$  iron(II) dichromate
49.  $\text{HBr}(\text{aq})$  hydrobromic acid
- ~~50.~~  $\text{CH}_3\text{COOH}$  acetic acid