



# Naming Simple Ionic Compounds

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Video Workbook with Dr. B

Ionic compounds are made of a Metal and Non-Metal.

Metal + Non-Metal = Ionic Compound

for example,  $\text{CaCl}_2$ ,  $\text{KBr}$ , or  $\text{Al}_3\text{N}_2$

These are called Binary Ionic compounds because they only have two different types of atoms.

1 H Hydrogen																	2 He Helium	
3 Li Lithium	4 Be Beryllium	Metals										Metalloids			Non-Metals			10 Ne Neon
11 Na Sodium	12 Mg Magnesium	Transition Metals										13 Al Aluminum	14 Si Silicon	15 P Phosphorus	16 S Sulfur	17 Cl Chlorine	18 Ar Argon	
19 K Potassium	20 Ca Calcium	21 Sc Scandium	22 Ti Titanium	23 V Vanadium	24 Cr Chromium	25 Mn Manganese	26 Fe Iron	27 Co Cobalt	28 Ni Nickel	29 Cu Copper	30 Zn Zinc	31 Ga Gallium	32 Ge Germanium	33 As Arsenic	34 Se Selenium	35 Br Bromine	36 Kr Krypton	
37 Rb Rubidium	38 Sr Strontium	39 Y Yttrium	40 Zr Zirconium	41 Nb Niobium	42 Mo Molybdenum	43 Tc Technetium	44 Ru Ruthenium	45 Rh Rhodium	46 Pd Palladium	47 Ag Silver	48 Cd Cadmium	49 In Indium	50 Sn Tin	51 Sb Antimony	52 Te Tellurium	53 I Iodine	54 Xe Xenon	
55 Cs Cesium	56 Ba Barium	57 La Lanthanum	72 Hf Hafnium	73 Ta Tantalum	74 W Tungsten	75 Re Rhenium	76 Os Osmium	77 Ir Iridium	78 Pt Platinum	79 Au Gold	80 Hg Mercury	81 Tl Thallium	82 Pb Lead	83 Bi Bismuth	84 Po Polonium	85 At Astatine	86 Rn Radon	
87 Fr Francium	88 Ra Radium	89 Ac Actinium	104 Rf Rutherfordium	105 Db Dubnium	106 Sg Seaborgium	107 Bh Bohrium	108 Hs Hassium	109 Mt Meitnerium	110	111	112	113	114					



[Metals, Non-Metals, and Metalloids on the Periodic Table](#)

## Keys to Naming Binary Ionic Compounds

Name the metal (the cation) as it appears on the Periodic Table.

$\text{Na}^+$  = Sodium

$\text{Mg}^{2+}$  = Magnesium

$\text{Al}^{3+}$  = Aluminum

For the non-metal (the anion) write the name on the Periodic Table and then replace the ending with *ide*.

- $\text{CaCl}_2$  = Calcium chlorine = Calcium chloride
- $\text{AlN}$  = Aluminum nitrogen = Aluminum nitride
- $\text{Na}_2\text{O}$  = Sodium oxygen = Sodium oxide

Essential Video: [How to Name Binary Ionic Compounds](#)

Practice with Video Explanations

[Extensive interactive practice naming.](#)

*This is one of the most effective ways to learn naming and formula writing.*



# Formula Writing for Simple Ionic Compounds

We must consider the *ionic charge* on each element to write the formulas for ionic compounds.

The general trend for ionic charge follows the groups on the Periodic Table.

Note that the charges for Transition Metals can vary depending on what elements they are bonded to.

For a more in-depth discussion, see:  
<https://youtu.be/M22YQ1hHhEY>

1+	2+	Trend for Ionic Charge				3+	4+	3-	2-	1-	0
		Transition Metals (charges vary)									

The chart above provides an easy to remember but very general trend. Note there are a number of exceptions.

The chart to the right gives you a sense of the exceptions.

1+	2+	Trends for Ionic Charge				3+	3-	2-	1-	0
1 H Hydrogen	2 He Helium	3 Li Lithium	4 Be Beryllium	5 B Boron	6 C Carbon	7 N Nitrogen	8 O Oxygen	9 F Fluorine	10 Ne Neon	
11 Na Sodium	12 Mg Magnesium	13 Al Aluminum	14 Si Silicon	15 P Phosphorus	16 S Sulfur	17 Cl Chlorine	18 Ar Argon			
19 K Potassium	20 Ca Calcium	21 Sc Scandium	22 Ti Titanium	23 V Vanadium	24 Cr Chromium	25 Mn Manganese	26 Fe Iron	27 Co Cobalt	28 Ni Nickel	
37 Rb Rubidium	38 Sr Strontium	39 Y Yttrium	40 Zr Zirconium	41 Nb Niobium	42 Mo Molybdenum	43 Tc Technetium	44 Ru Ruthenium	45 Rh Rhodium	46 Pd Palladium	
55 Cs Cesium	56 Ba Barium	57 La Lanthanum	58 Ce Cerium	59 Pr Praseodymium	60 Nd Neodymium	61 Pm Promethium	62 Sm Samarium	63 Eu Europium	64 Gd Gadolinium	
87 Fr Francium	88 Ra Radium	89 Ac Actinium	90 Th Thorium	91 Pa Protactinium	92 U Uranium	93 Np Neptunium	94 Pu Plutonium	95 Am Americium	96 Cm Curium	

## Keys to Writing Formulas for Binary Ionic Compounds:

- Write the symbols for each element.
- Find the charge for each element using the Periodic Table. Write it above each element.
- See if the charges are balanced (if they are you're done!)
- Add subscripts (if necessary) so the charge for the entire compound is zero.
- Use the crisscross method to check your work.
  
- Don't write the subscript '1'.
- If you use the criss-cross method and end up with something like Ca<sub>2</sub>S<sub>2</sub> you'll need to reduce the subscripts to Ca<sub>1</sub>S<sub>1</sub> which we write as CaS.

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Report errors and suggestions to [DrB@breslyn.org](mailto:DrB@breslyn.org)

