

Periodic Table with bonding rules based on location of first elements

IF First element is red
 → Sum charges to zero to write correct chemical formula
 → DO NOT INCLUDE PREFIXES OR ROMAN NUMERALS in chemical name

IF First element is green
 → Sum charges to zero to write the correct chemical formula
 → Use a roman numeral to indicate the charge of the metal in chemical name
 → DO NOT INCLUDE PREFIXES in chemical name

IF First element is blue
 → Write the chemical formula by looking at the prefixes in the chemical name. The prefixes in the chemical name tell you how many of each atom you have.
 → To write the chemical name, add a prefix to the first and second element based on what the subscripts of each of those elements are.
 → Mono=1, di=2, tri=3, tetra=4, penta=5, hexa=6, hepta=7, octa=8, nona=9, deca=10
 → Do Not Use the prefix mono on the first element.

PERIODIC TABLE OF THE ELEMENTS

Multiple Charges
 Roman numeral of metal = charge

Ali will have -ide endings in the name

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Polyatomic Ions

Polyatomic Ions	
NH ₄ ⁺	Ammonium
BrO ₃ ⁻	Bromate
CN ⁻	Cyanide
C ₂ H ₃ O ₂ ⁻	Acetate
(CH ₃ COO) ⁻	Acetate
ClO ₄ ⁻	Perchlorate
ClO ₃ ⁻	Chlorate
ClO ₂ ⁻	Chlorite
ClO ⁻	Hypochlorite
IO ₃ ⁻	Iodate
MnO ₄ ⁻	Permanganate
NO ₃ ⁻	Nitrate
NO ₂ ⁻	Nitrite
OH ⁻	Hydroxide
HCO ₃ ⁻	Hydrogen carbonate
HSO ₄ ⁻	Hydrogen sulfate
SCN ⁻	Thiocyanate
CO ₃ ²⁻	Carbonate
Cr ₂ O ₇ ²⁻	Dichromate
CrO ₄ ²⁻	Chromate
SO ₄ ²⁻	Sulfate
SO ₃ ²⁻	Sulfite
PO ₄ ³⁻	Phosphate

NOTE THE DIFFERENCES BETWEEN THE ENDINGS

Cl = Chlorine
 Cl⁻ = Chloride
 ClO₃⁻ = Chlorate
 ClO₂⁻ = Chlorite

Based on the location of the first element, apply your bonding rules shown above to write the correct chemical formula based on the chemical names for each compound.

First element is a red metal	First element is a green metal	1st element is blue nonmetal
Magnesium Chloride	Titanium (II) Chloride	Carbon dichloride
Aluminum Chlorate	Iron(I) Phosphate	Silicon heptasulfide
Silver Nitride	Lead(III)Sulfide	TetraCarbon decaselenide
Zinc Nitrate	Manganese(III)Sulfate	Oxygen hexabromide

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ClO ₂ ⁻	Chlorite
ClO ⁻	Hypochlorite
IO ₃ ⁻	Iodate
MnO ₄ ⁻	Permanganate
NO ₃ ⁻	Nitrate
NO ₂ ⁻	Nitrite
OH ⁻	Hydroxide
HCO ₃ ⁻	Hydrogen carbonate
HSO ₄ ⁻	Hydrogen sulfate
SCN ⁻	Thiocyanate
CO ₃ ²⁻	Carbonate
Cr ₂ O ₇ ²⁻	Dichromate
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First element is a red metal	First element is a green metal	1st element is blue nonmetal
Li ₃ N	Zr ₃ N	C ₃ N
Al(NO ₃) ₃	Mn(NO ₂) ₃	CH ₄
Ag ₃ P	VBr ₃	O ₃ Cl ₉
Zn ₃ (PO ₃) ₂	Cr(BrO ₃) ₂	CN ₇

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 -> Mono-, di-, tri-, tetra-, penta-, hexa-, hepta-, octa-, nona-, deca-
 -> Do Not Use the prefix mono on the first element.

PERIODIC TABLE OF THE ELEMENTS

Multiple Charges
 Roman numeral of metal = charge

All will have ionic endings in the name

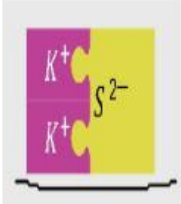
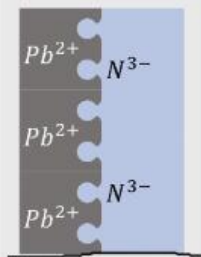
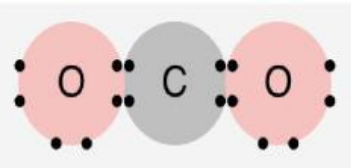
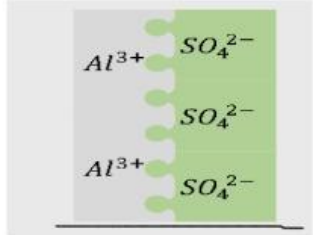
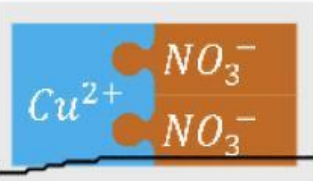
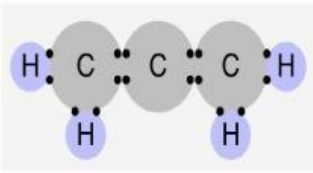
Polyatomic Ions

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IO ₃ ⁻	Iodate
MnO ₄ ⁻	Permanganate
NO ₃ ⁻	Nitrate
NO ₂ ⁻	Nitrite
OH ⁻	Hydroxide
HCO ₃ ⁻	Hydrogen carbonate
HSO ₄ ⁻	Hydrogen sulfate
SCN ⁻	Thiocyanate
CO ₃ ⁻	Carbonate
Cr ₂ O ₇ ⁻	Dichromate
CrO ₄ ⁻	Chromate
SO ₄ ⁻	Sulfate
SO ₃ ⁻	Sulfite
PO ₄ ⁻	Phosphate

NOTE THE DIFFERENCES BETWEEN THE ENDINGS

Cl = Chlorine
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 ClO₃⁻ = Chlorate
 ClO₂⁻ = Chlorite

Based on the model of the ionic and covalent bonds shown, write the chemical name above the picture and write the chemical formula below the picture.

First element is a red metal	First element is a green metal	1st element is blue nonmetal
Chemical Name 	Chemical Name 	Chemical Name 
Chemical Formula	Chemical Formula	Chemical Formula
Chemical Name 	Chemical Name 	Chemical Name 
Chemical Formula	Chemical Formula	Chemical Formula

1A 2A
 Ve: 1 2
 Ox#: +1 +2

3A 4A 5A 6A 7A 8A
 3 4 5 6 7 8
 +3 +4 -3 -2 -1 0

Polyatomic Ions		PERIODIC TABLE OF THE ELEMENTS																	
NH ₄ ⁺	Ammonium	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
BrO ₃ ⁻	Bromate	1A	2A	3A	4A	5A	6A	7A	8A	1A	2A	3A	4A	5A	6A	7A	8A	1A	2A
CN ⁻	Cyanide	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
C ₂ H ₃ O ₂ ⁻	Acetate	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
(CH ₃ COO) ⁻	Acetate	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
ClO ₄ ⁻	Perchlorate	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
ClO ₃ ⁻	Chlorate	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
ClO ₂ ⁻	Chlorite	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
ClO ⁻	Hypochlorite	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
IO ₃ ⁻	Iodate	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
MnO ₄ ⁻	Permanganate	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
NO ₃ ⁻	Nitrate	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
NO ₂ ⁻	Nitrite	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
OH ⁻	Hydroxide	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
HCO ₃ ⁻	Hydrogen carbonate	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
HSO ₄ ⁻	Hydrogen sulfate	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
SCN ⁻	Thiocyanate	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
CO ₃ ²⁻	Carbonate	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Cr ₂ O ₇ ²⁻	Dichromate	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
CrO ₄ ²⁻	Chromate	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
SO ₄ ²⁻	Sulfate	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
SO ₃ ²⁻	Sulfite	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
PO ₄ ³⁻	Phosphate	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

MEMORIZE: Ag has ____ Charge and Zn has ____ Charge

Ultimately it is the location of the _____ element in a bond that determines what type of bond you have and what rules you follow.

- **Red** + blue → ionic 1 bonding → Electrons are _____.
- When asked to write a chemical formula from a chemical name, ensure that you _____.
- When asked to write a chemical name given a chemical formula, ensure that you _____.
- **Green** + blue → ionic 2 bonding → Electrons are _____.
- When asked to write a chemical formula from a chemical name, ensure that you _____.
- When asked to write a chemical name given a chemical formula, ensure that you _____.
- **Blue** + blue → covalent bonding → Electrons are _____.
- When asked to write a chemical formula from a chemical name, ensure that you _____.
- When asked to write a chemical name given a chemical formula, ensure that you _____.