

WRITING FORMULAS AND NAMING COMPOUNDS:

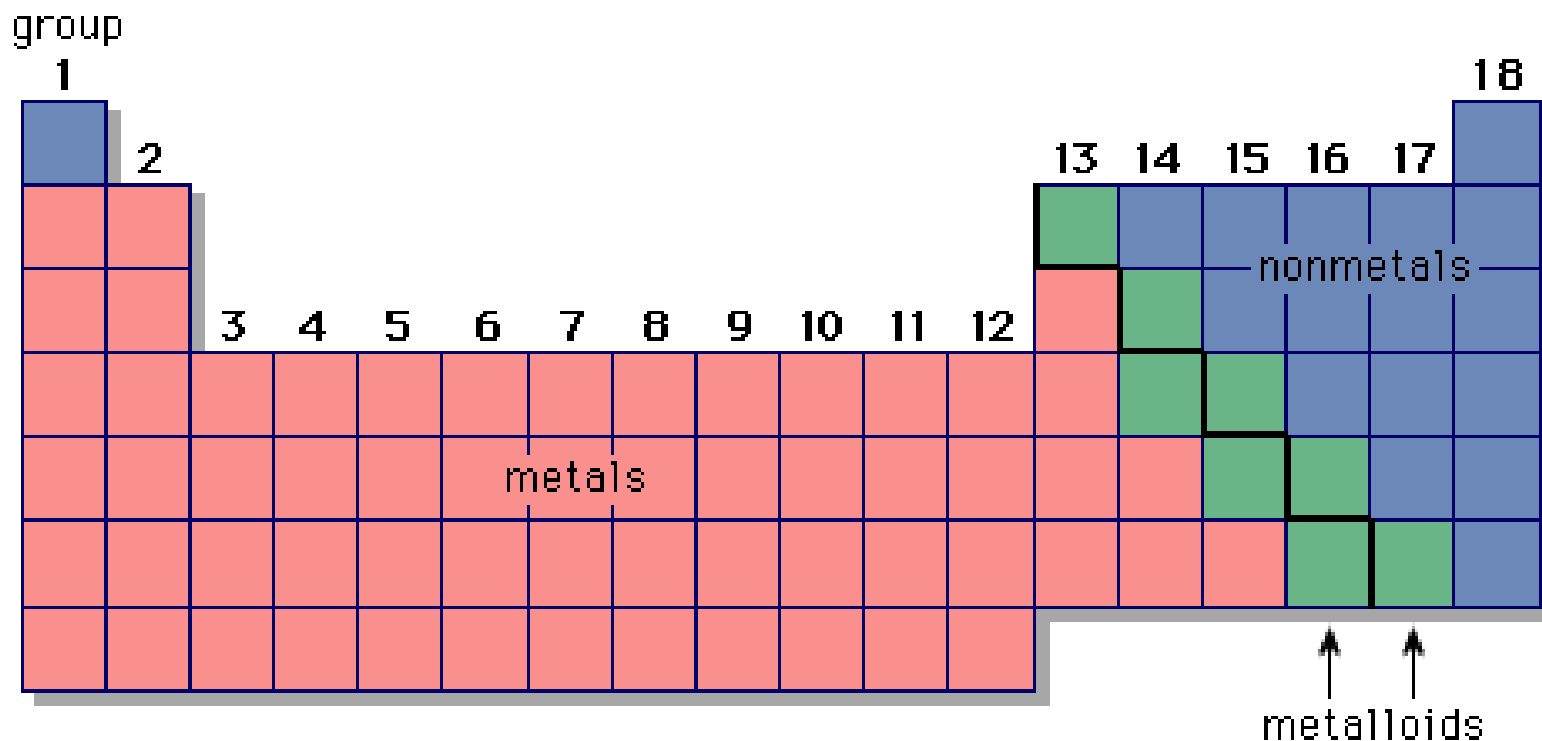
How does it all work?



The atomic
symbol for
confusion

rutube.yokomk

NAMING A COMPOUND DEPENDS UPON WHAT TYPES OF ELEMENTS ARE IN THE COMPOUND!



WITH YOUR NEIGHBOR, FIND PATTERNS IN NAMING FOR THE FOLLOWING:

Name	Formula
carbon monoxide	CO
iron(III) bromide	FeBr ₃
dinitrogen tetrasulfide	N ₂ S ₄
phosphorous pentachloride	PCl ₅
calcium phosphide	Ca ₃ P ₂
boron triiodide	BI ₃

TWO TYPES OF COMPOUNDS

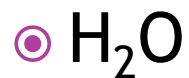
⊙ Molecular (covalent) compounds

- Share electrons
- Non-metal bonded to non-metal
- Use prefixes in the name
- Prefixes determine subscripts in formula

⊙ Ionic compounds

- One atom donates electrons; the other accepts
- Metal bonded to non-metal
- Do not use prefixes in the name
- Charges determine how to write the formula

LET'S TRY SOME EXAMPLES!



dihydrogen monoxide



calcium sulfide



dinitrogen tetroxide



potassium phosphide

PRACTICE NAMING THESE!!

1. Cl_2O
2. Na_2O
3. KCl
4. PH_3
5. Li_2Se
6. N_2O_5
7. Al_2O_3

METALS VS. NONMETALS

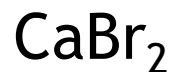
- ⦿ Metals generally lose electrons to become cations (positively charged ions)
- ⦿ Nonmetals can gain electrons to become anions (negatively charged ions)
- ⦿ An ion is any atom or group of atoms with a charge

CHARGES

- ⦿ Group 1: 1+
- ⦿ Group 2: 2+
- ⦿ Group 13: 3+
- ⦿ Group 15: 3-
- ⦿ Group 16: 2-
- ⦿ Group 17: 1-
- ⦿ (Group 18: 0)

LET'S TRY SOME EXAMPLES!

⦿ calcium bromide



⦿ silicon tetrafluoride



⦿ magnesium selenide



⦿ carbon monoxide



MORE CHARGES

- ⦿ Copper (Cu): 1+,2+
- ⦿ Iron (Fe): 2+,3+
- ⦿ Zinc (Zn): 2+
- ⦿ Silver (Ag): 1+
- ⦿ Lead (Pb): 2+,4+
- ⦿ Tin (Sn): 2+,4+

WHAT IF YOUR METAL HAS MULTIPLE CHARGES?

- Indicate the charge using a Roman numeral
- Example: In CuCl_2 , the copper has a 2+ charge, so it is called copper(II) chloride.
- Try these:
 - FeN
 - KCl
 - SnF_4
 - PbO_2

WRITING FORMULAS/NAMING WITH POLYATOMIC IONS

- Any compound with a polyatomic ion is ionic
- Treat the polyatomic ion like one unit
- If you need more than one polyatomic ion in a formula, put it in parentheses

- Examples:

magnesium chlorate

ammonium sulfite

$\text{Pb}(\text{NO}_3)_2$

potassium fluoride

$\text{Mg}(\text{ClO}_3)_2$

$(\text{NH}_4)_2\text{SO}_3$

lead(II) nitrate

KF

CLASSICAL (“OLD-SCHOOL”) NAMING

- Uses Latin roots to indicate elements
- Uses suffixes to indicate charge
 - ic = larger charge
 - ous = smaller charge
- Example:
 - Ferric oxide
 - Iron (III) oxide
 - Fe_2O_3

YOU'LL NEED TO KNOW THESE:

⦿ cupric (Cu²⁺)

⦿ cuprous (Cu⁺)

⦿ ferric (Fe³⁺)

⦿ ferrous (Fe²⁺)

⦿ plumbic (Pb⁴⁺)

⦿ plumbous (Pb²⁺)

⦿ stannic (Sn⁴⁺)

⦿ stannous (Sn²⁺)

LET'S TRY A FEW

- ⦿ cuprous chloride
- ⦿ plumbous nitride
- ⦿ $\text{Cu}(\text{NO}_3)_2$
- ⦿ SnCl_4
- ⦿ ferrous sulfite