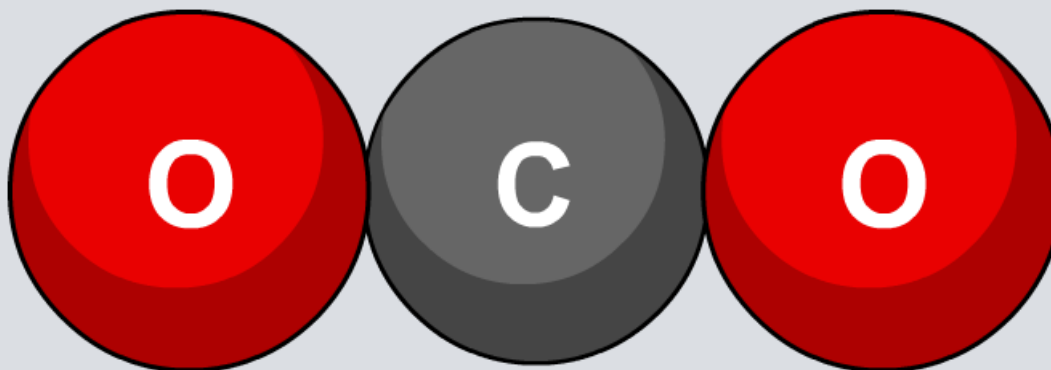


Naming Compounds



To name simple compounds of metals and nonmetals:

1. Write down the name of the metal.
2. Write down the name of the nonmetal, changing the ending of the word to “-ide.”

What is the name of the compound made when the following elements combine?

- | | |
|------------------------|-----------------|
| ● magnesium and oxygen | magnesium oxide |
| ● sodium and chlorine | sodium chloride |
| ● oxygen and iron | iron oxide |



Naming compounds

What is the name of each compound formed by these metal and nonmetal elements?

Element 1	Element 2	Compound
iron	sulfur	iron sulfide
magnesium	nitrogen	magnesium nitride
sodium	chlorine	sodium chloride
tin	oxygen	tin oxide
aluminum	bromine	aluminum bromide
nickel	iodine	nickel iodide
zinc	sulfur	zinc sulfide
lithium	nitrogen	lithium nitride



Naming compounds containing oxygen

Many compounds contain more than two elements.

For compounds containing two elements **plus** oxygen, the ending of the other nonmetal usually changes to “**-ate**”.

Element 1	Element 2	Element 3	Compound
nickel	sulfur	oxygen	nickel sulfate
magnesium	nitrogen	oxygen	magnesium nitrate
sodium	nitrogen	oxygen	sodium nitrate
copper	sulfur	oxygen	copper sulfate
aluminum	bromine	oxygen	aluminum bromate



Composition of compounds

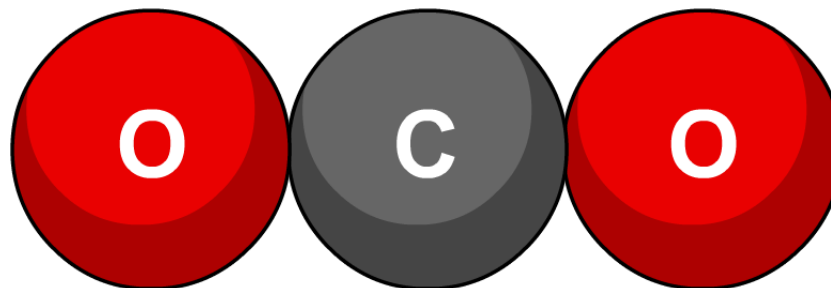
A compound contains atoms from different elements that are chemically joined together.

A compound always contains a particular amount of each element. It has a fixed composition.

Compound names can get quite long and complicated, so the symbols of the elements are used as a shorthand.

The symbols of the elements in a compound are combined to give the **formula** of the compound.

What is the formula of carbon dioxide?



The formula of a compound uses chemical symbols and numbers to show the ratio of atoms of each element present.

To figure out the formula of an ionic compound:

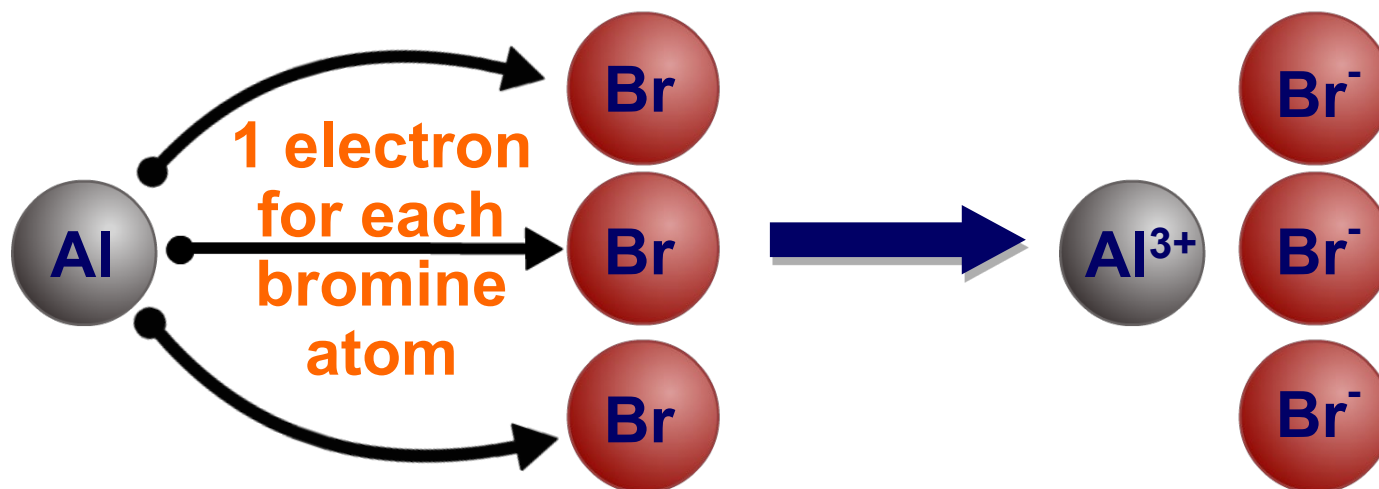
1. Write down the symbol for each element – the metal is always written first.
2. Calculate the charge for each type of ion.
3. Balance the number of ions so that the positive and negative charges are balanced and equal zero. This gives the ratio of ions.
4. Use the ratio to write down the formula of the ionic compound.



Formula of aluminum bromide

What is the formula of aluminum bromide?

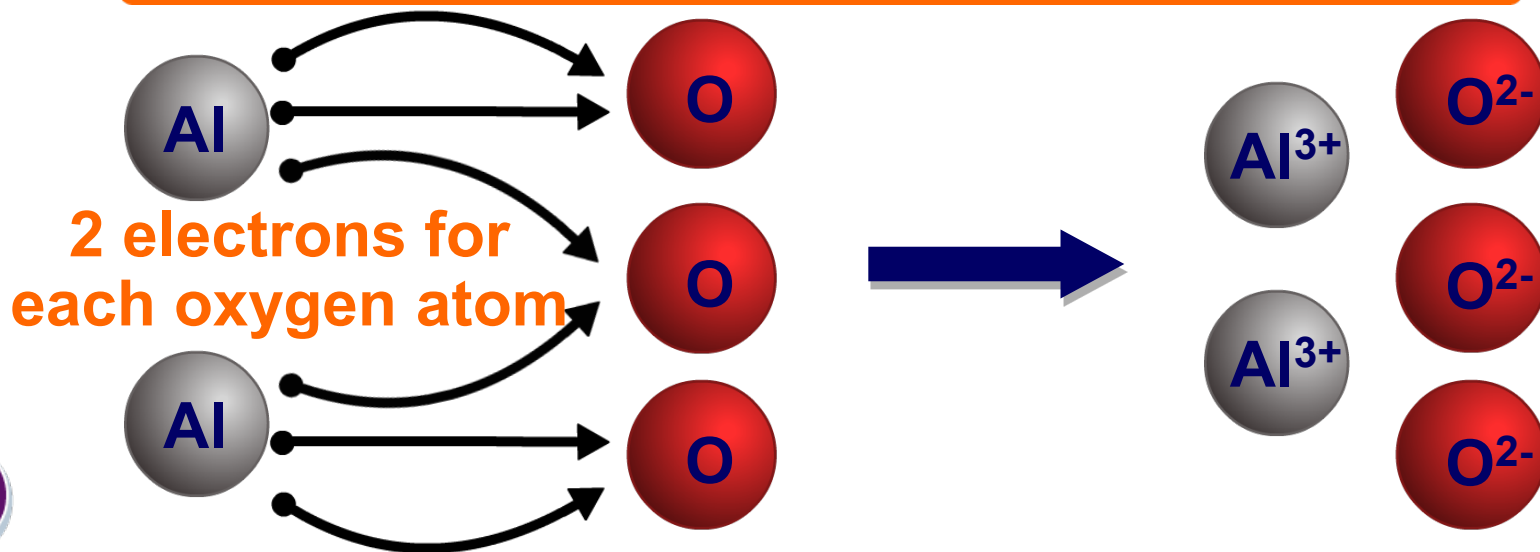
Symbol	Al	Br
Ion charge	+3	-1
Balance the number of ions	3 bromide ions are needed for each aluminum ion	
Ratio of ions	1 : 3	
Formula	AlBr₃	



Formula of aluminum oxide

What is the formula of aluminum oxide?

Symbol	Al	O
Ion charge	+3	-2
Balance the number of ions	2 aluminum ions are needed for 3 oxide ions	
Ratio of ions	2 : 3	
Formula	Al_2O_3	



More ionic formulae

What are the formulae of all the possible ionic compounds from combinations of these metals and nonmetals?

metals non- metals	Li	Ca	Na	Mg	Al	K
F	LiF	CaF ₂	NaF	MgF ₂	AlF ₃	KF
O	Li ₂ O	CaO	Na ₂ O	MgO	Al ₂ O ₃	K ₂ O
N	Li ₃ N	Ca ₃ N ₂	Na ₃ N	Mg ₃ N ₂	AlN	K ₃ N
Br	LiBr	CaBr ₂	NaBr	MgBr ₂	AlBr ₃	KBr
S	Li ₂ S	CaS	Na ₂ S	MgS	Al ₂ S ₃	K ₂ S
Cl	LiCl	CaCl ₂	NaCl	MgCl ₂	AlCl ₃	KCl



What is the ionic formula?

What is the formula for each ionic compound?

Symbol	Li	NO ₃
Ion charge	1+	1-
Balance the number of ions	1 lithium ion is needed for each nitrate ion	
Ratio of ions	1 : 1	
Formula	?	



Formula 1 of 4



solve



How is the ratio of atoms calculated?

To calculate the ratio of atoms in a stable covalent compound:

1. Figure out how many electrons are needed by each nonmetal element to complete its outer electron shell.
2. Find the ratio of atoms that will provide enough shared electrons to fill all the outer shells.

For example, how many nitrogen and hydrogen atoms bond together in an ammonia molecule?

element	N	H
electron configuration	(2.5)	(1)
electrons needed	3	1
ratio of atoms	1	3

Covalent bonding in ammonia

How do nitrogen and hydrogen atoms form covalent bonds in a molecule of **ammonia**?

element	N	H
electron configuration	(2.5)	(1)
electrons needed	3	1
ratio of atoms	1	3

