

Unit 3: Ionic Bonding

Why do atoms bond?

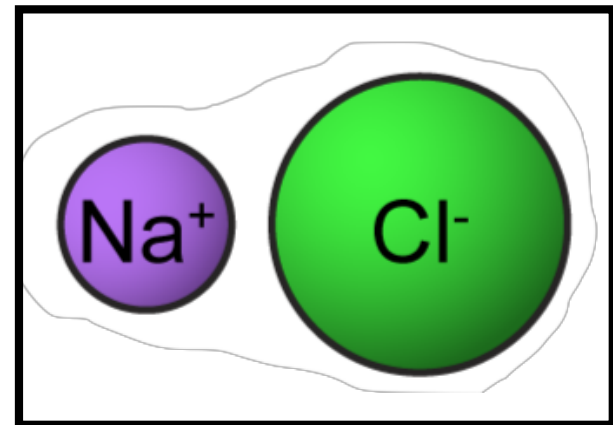
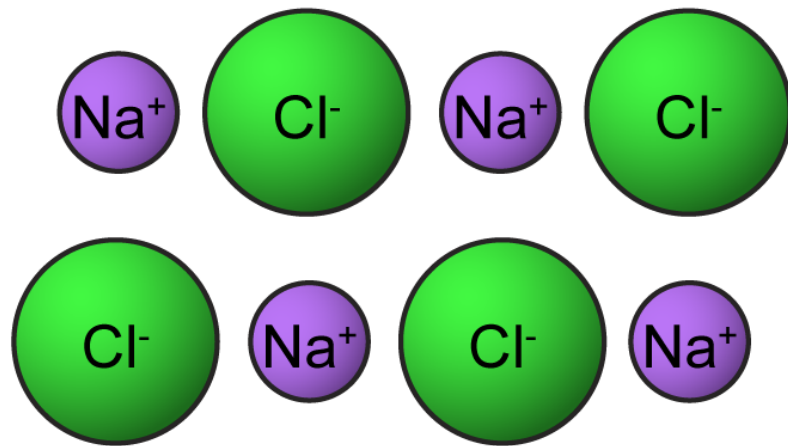
To become more stable.

Ionic compound:

a pure substance composed of positive and negative ions (net charge of 0)

Formula unit:

the simplest whole number ratio of ions in an ionic compound



Draw this diagram!

formula unit



(1 Na:1 Cl)



(1 Fe:3 Cl)

~~(3 Fe:9 Cl)~~

reduce!

Types of Ions

monatomic ions
(a single atom)

Example:



only sodium

polyatomic ions
(2 or more atoms)

Example:



nitrogen and oxygen

*polyatomic ions with
oxygen = oxyanions

See the back of your periodic table!

Ion Hints

**Metals form
cations (+)**

**Nonmetals form
anions (-)**

**Group 1A: +1
Group 2A: +2
Group 3A: +3**

**Group 5A: -3
Group 6A: -2
Group 7A: -1**

**Same as element
name**

**Change ending
(suffix) to -ide**

Ion Hints

Metals that can have multiple charges

oxyanions

Use roman numerals to identify charge

Change suffix
-ite (fewer oxygens)
-ate (more oxygens)

Fe^{2+} iron(II)

Fe^{3+} iron(III)

SO_3^{2-} sulfite

SO_4^{2-} sulfate

↑
No space!!!

Writing Chemical Formulas for Ionic Compounds

Chemical formulas indicate the number of atoms in a compound.

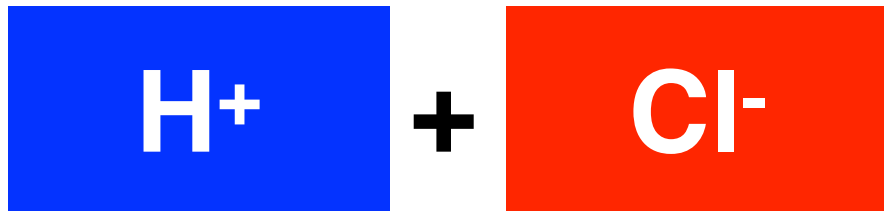
Rules:

1. Write the cation (+) first
2. Combine ions to get a net charge of 0

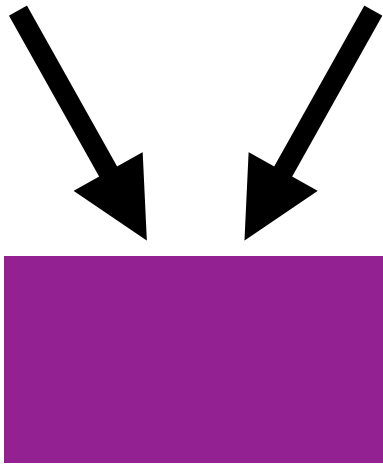
****Compounds have an overall charge of ZERO!**

Practice

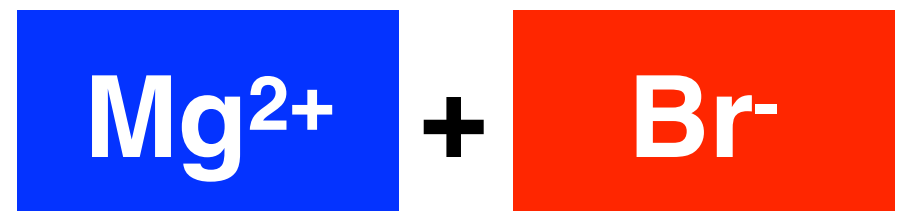
Ex. 1



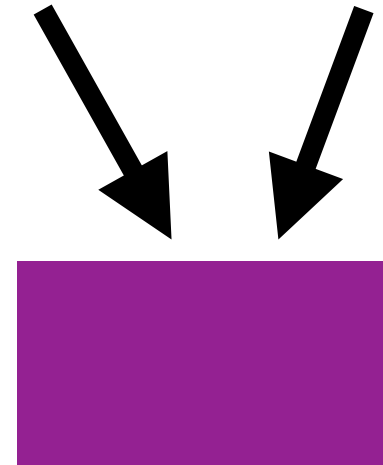
$(+1) + (-1) = 0$



Ex. 2



$(+2) + (-1) = 0$



To be completed in class!
(Answers will go in purple box)

Practice

H⁺

+

Cl⁻

+1

+

-1

= 0

HCl

Mg²⁺

+

Br⁻

+2

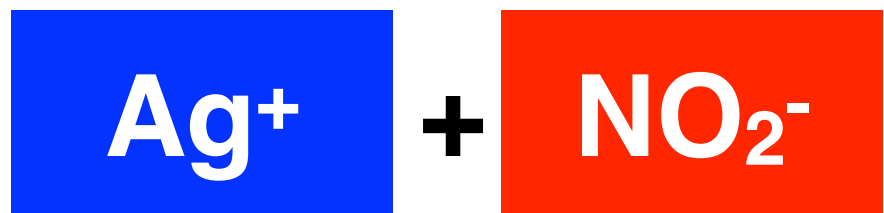
+

2(-1) = 0

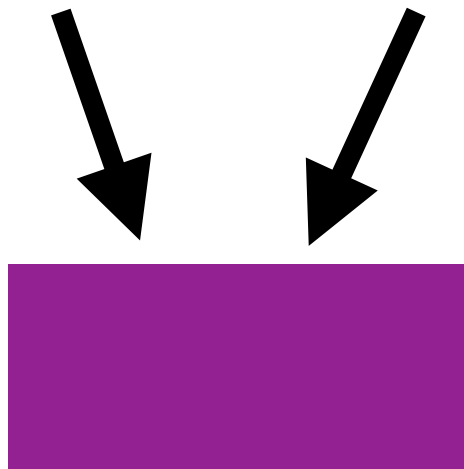
MgBr₂

Practice

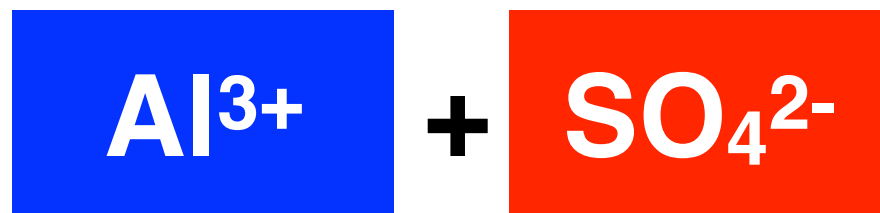
Ex. 3



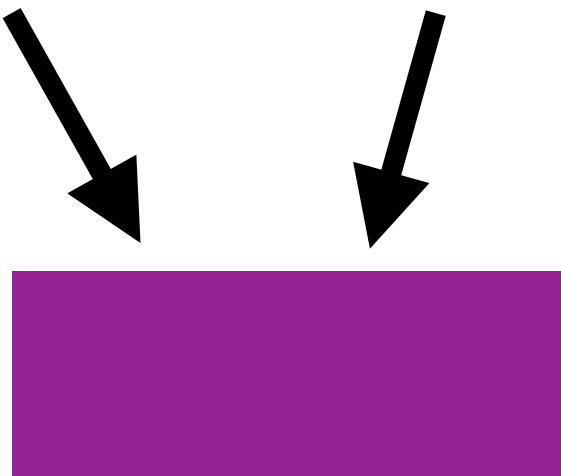
$$(+1) + (-1) = 0$$



Ex. 4



$$(+3) + (-2) = 0$$



To be completed in class!
(Answers will go in purple box)

Practice



+



+1

+

-1

= 0



+



2(+3)

+

3(-2) = 0



*need parentheses