

Chemical Party.mp4

# Chemical Bonding

What is it? **Union of 2 or more atoms through the transfer or sharing of electrons.**

## 2 types of binary compounds

<u>Ionic</u> bonds	Covalent bonds
a metal donates e- to a non metal <i>losing + gaining</i>	non metals sharing e- with other non metals <i>* sharing</i>
form ions	do not form ions

*ionic* .....  
**Valence:** The number of bonds an element can make.

Same number as ion, but remove the + and - sign.

*Gr* 1 2 3 4 5 6 7 8  
 1 2 3 4 3 2 1 ~~0~~

Ionic and covalent bonding animation.mp4

Covalent Bond.mp4

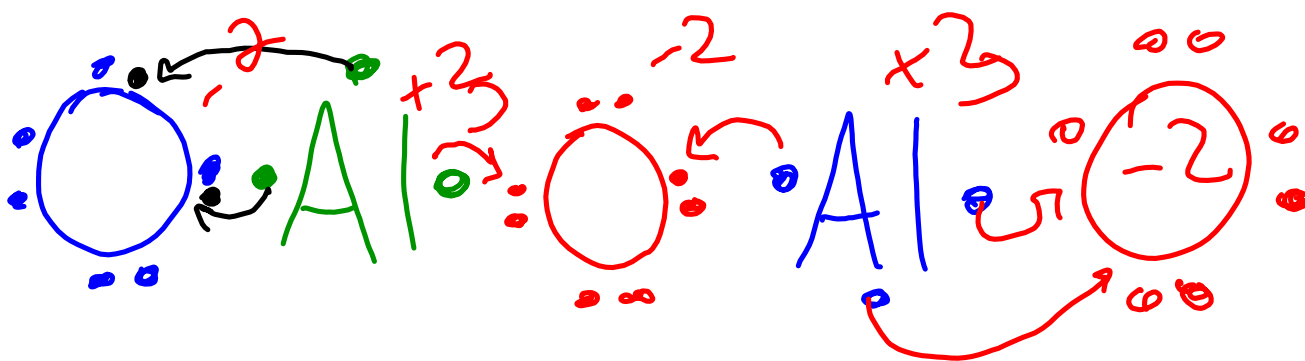
Chemistry Music Video 16 What Kind Of Bonds Are These.mp4

# Going from name to molecular formula

## a) Ionic bonds

	Lewis structure	x-over rule	molecular formula
potassium chloride			KCl
magnesium oxide			MgO
calcium chloride			CaCl <sub>2</sub>
lithium sulfide			Li <sub>2</sub> S
aluminum oxide			Al <sub>2</sub> O <sub>3</sub>

Will the molecular formula always be the same when bonding different elements from the same family with different elements from the same family?



## b) covalent bond

## Prefixes

mono= 1      di= 2      tri= 3      tetra= 4  
 penta= 5      hexa= 6      hepta= 7      octa= 8

- x-over rule does not need to be done because it was **already done**, the number of atoms is in the name.

- Elements need to become **stable octet** = 8 electrons around the elements except H needs 2.

\* Hydrogen forms a covalent bond.

- Boron forms a covalent bond.

	Lewis diagram	molecular structure
Gr. 4 4 carbon tetrachloride		CCl <sub>4</sub>
Gr. 6 2 sulfur dichloride		SCl <sub>2</sub>
Gr. 6 2 dihydrogen sulfide		H <sub>2</sub> S
phosphorus trichloride		PCl <sub>3</sub>

## 7 diatomic gases

Form covalent bonds and always found as a **pair** of atoms bonded with themselves.

I Have No BRight Or CLever Friends

F <sub>2</sub> , Cl <sub>2</sub> , Br <sub>2</sub> , I <sub>2</sub>	O <sub>2</sub>	N <sub>2</sub>	H <sub>2</sub>
Group 7 shares 1 	Group 6 shares 2 	Gr. 5 shares 3 	Gr. 1 
Wrong, this has too many electrons!	Wrong, no octet	Correct. Double bond obeys the octet rule.	

## Going from molecular structure to name

### a) Ionic rule

- 1- Write name of 1st element
  - 2- Write name of second element
  - 3- End second element with suffix 'ide'
- \* prefixes are never used

Na <sub>3</sub> P	Al <sub>2</sub> O <sub>3</sub>	Li <sub>2</sub> S	NaCl	CaCl <sub>2</sub>
Sodium Phosphide	Aluminum Oxide	Lithium Sulfide	Sodium Chloride	Calcium Chloride

### b) Covalent rule

\* non-metal 1<sup>st</sup>

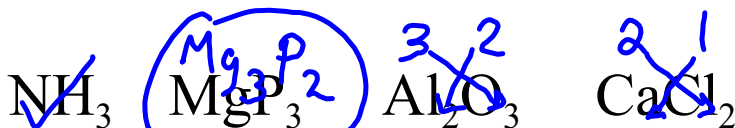
- 1- 1st element use prefix if more than one atom
- 2- 2nd element use prefix if more than one atom. \* do not use mono
- \* Use 'mono' if the atom is oxygen and there is only one atom.

- 3- Always end second element with suffix 'ide'

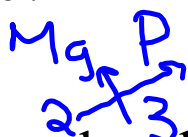
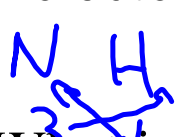
P <sub>2</sub> S <sub>3</sub>	HCl	H <sub>2</sub> O	H <sub>2</sub> S	SF <sub>2</sub>	CCl <sub>4</sub>
Diphosphorus Trisulfide	Hydrogen Chloride	dihydrogen monoxide	dihydrogen sulfide	Sulfur Difluoride	Carbon tetrachloride

## Past Exam Questions

1. Four existing common compounds are listed below:



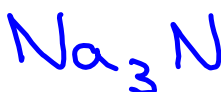
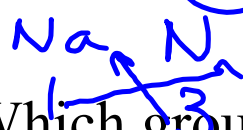
Which of the above compounds does not satisfy the octet rule?



metal ionic

2. What is the molecular formula of sodium nitride?

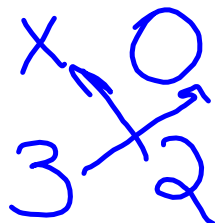
- A)  $\text{S}_3\text{N}$     **B)  $\text{Na}_3\text{N}$**     C)  $\text{NaN}$     D)  $\text{NaN}_3$



3. Which group of substances consists only of substances formed by covalent bonds?

- A)  ~~$\text{K}_2\text{O}$ ,  $\text{PCl}_3$ ,  $\text{H}_2\text{S}$~~     C)  ~~$\text{CH}_4$ ,  $\text{CaS}$ ,  $\text{NCl}_3$~~   
 B)  **$\text{NaCl}$ ,  $\text{MgO}$ ,  $\text{AlF}_3$**     D)  **$\text{NH}_3$ ,  $\text{O}_2$ ,  $\text{P}_2\text{O}_3$**

4. Element X combines with oxygen to form the compound  $\text{X}_2\text{O}_3$ . To which family in the periodic table could element X belong?










Boron





## Attachments

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-  Chemical\_Party.mp4  
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-  Ionic\_and\_covalent\_bonding\_animation.mp4
-  Chemistry\_Music\_Video\_16\_What\_Kind\_Of\_Bonds\_Are\_These.mp4
-  Covalent\_Bond.mp4
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