

# 5. CHEMICAL COMPOUNDS

CH30S

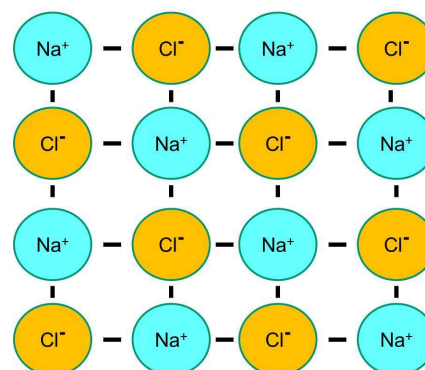
UNIT 1 – ELEMENTS &amp; COMPOUNDS

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## IONIC COMPOUNDS

- Ionic compounds contain positive ions called **cations**, and negative ions called **anions**.
- Cations** usually form when **metal** atoms **lose electrons** and **anions** usually form when **non-metal** atoms **gain electrons**.
- These ions combine in specific ratios to form **solid crystal lattices**.

Crystal Lattice of NaCl (table salt)



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## BINARY IONIC COMPOUNDS

### HOW DO I RECOGNIZE THESE?

Example: **Aluminum oxide**

Example: **CaCl<sub>2</sub>**

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## MULTIVALENT IONIC COMPOUNDS

### HOW DO I RECOGNIZE THESE?

Example: **Iron(III) chloride**

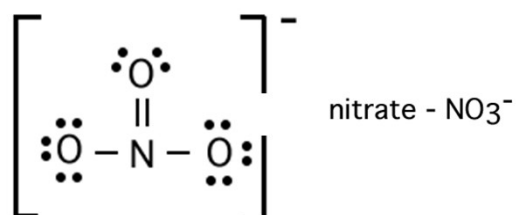
Example: **Cu<sub>2</sub>S**

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## POLYATOMIC IONIC COMPOUNDS

- Many ionic compounds, such as baking soda (sodium bicarbonate) and battery acid (hydrogen sulphate) contain more than 2 different elements.
- These compounds contain a **POLYATOMIC ION**, a group of non-metal atoms that bond together and have a negative charge.



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## POLYATOMIC IONIC COMPOUNDS

### HOW DO I RECOGNIZE THESE?

Example: **barium nitrate**

Example: **ammonium sulfate**

Example: **Zinc hydroxide**

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## POLYATOMIC IONIC COMPOUNDS (cont'd)

### HOW DO I RECOGNIZE THESE?

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Example:  $\text{CaCO}_3$

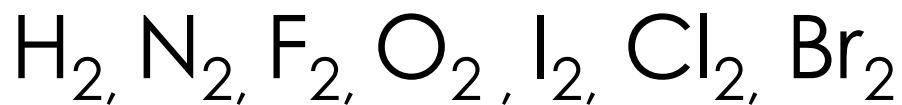
Example:  $\text{Ca}_3(\text{PO}_4)_2$

Example:  $\text{NH}_4\text{NO}_3$

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## COVALENT MOLECULES

Some elements naturally exist in molecule form rather than atom form. They are called diatomic elements



“Have No Fear Of Ice Cold Beer!”

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## COVALENT COMPOUNDS

Some covalent compounds have **common names** like :

$\text{H}_2\text{O}$	=	water	=	dihydrogen monoxide
$\text{NH}_3$	=	ammonia	=	nitrogen trihydride
$\text{CH}_4$	=	methane	=	carbon tetrahydride
$\text{H}_2\text{O}_2$	=	hydrogen peroxide	=	dihydrogen dioxide
$\text{O}_3$	=	ozone	=	trioxide

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## COVALENT COMPOUNDS

First element:

- Keeps its element name
- Gets a prefix if there is a subscript on it**

Second element:

- Use the root of the element name plus the *-ide* suffix
- Always use a prefix on the second element**

**Number**

**Prefix**

1	mono-
2	di-
3	tri-
4	tetra-
5	penta-
6	hexa-
7	hepta-
8	octa-
9	nona-
10	deca-

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# COVALENT COMPOUNDS

## HOW DO I RECOGNIZE THESE?

Example:  $\text{P}_2\text{O}_5$

Example:  $\text{N}_2\text{O}$

Example: carbon monoxide

Example: nitrogen triiodide

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