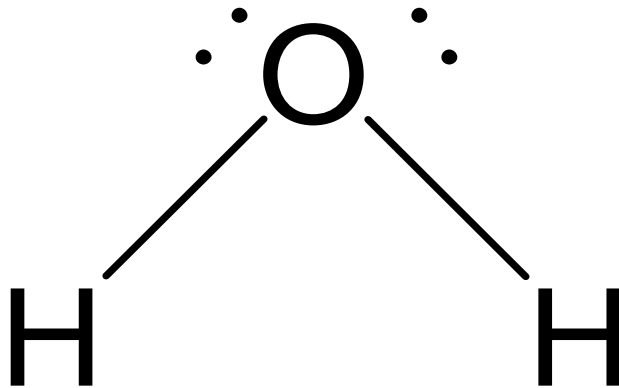


Molecules:

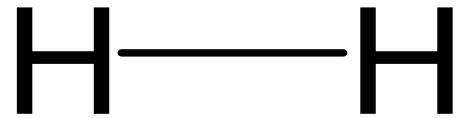
Molecule - A particle formed from two or more atoms that are bound tightly together.

Ex: H₂O



Molecules:

diatomic molecules- Molecules that contain two atoms joined together. Ex: H₂



polyatomic molecules - Molecules that contain more than two atoms joined together.
Ex: H₂O and H₂O₂

Ionic Compounds or Salts:

A salt is a compound consisting of ions.

Ion - A particle that is made up of an atom or group of atoms and bears a positive or negative charge.

cation- positive charge(electrons lost)

anion- negative charge(electrons gained)

Ions:

Consider Na^+ and Cl^-

	Na atom	Na⁺ ion	Cl atom	Cl⁻ ion
Protons (+)	11	11	17	17
Electrons (-)	11	10	17	18

Ions cont..:

Monatomic ions: Ions formed from a single atom.

Polyatomic Ions: Ions consisting of more than one atom. Ex: NH_4^+ , $\text{C}_2\text{H}_3\text{O}_2^-$

Ions can lose or gain more than one electron.

Ex: Al^{3+} (lost 3 electrons)

Fe^{2+} (lost 2 electrons)

S^{2-} (gained 2 electrons)

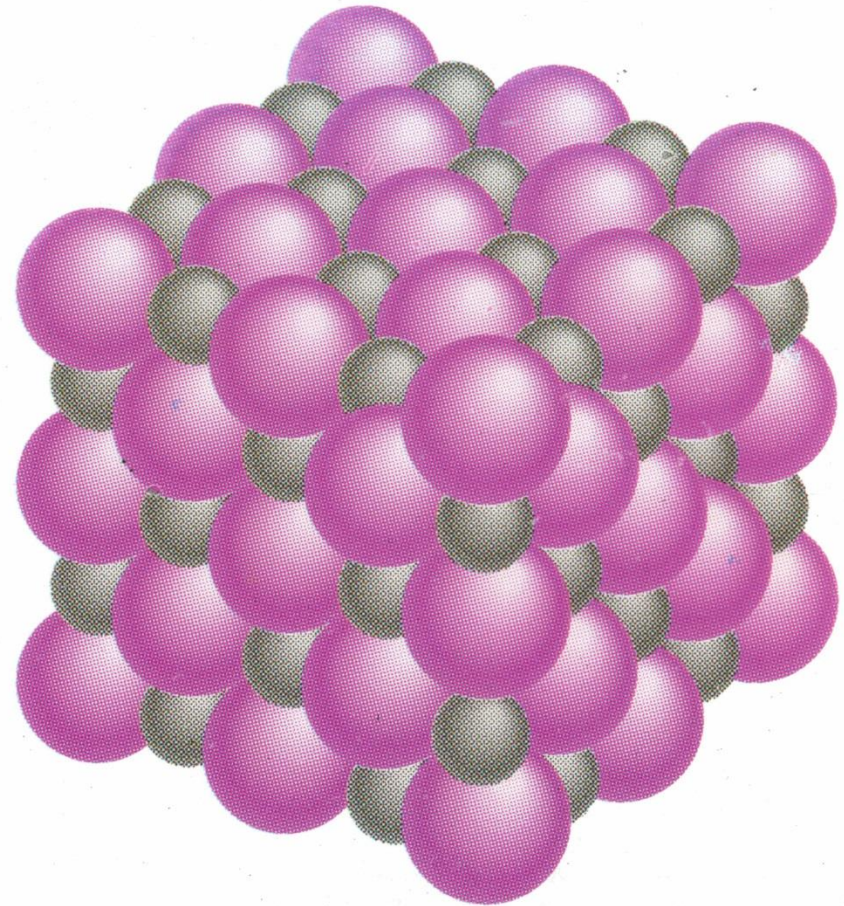
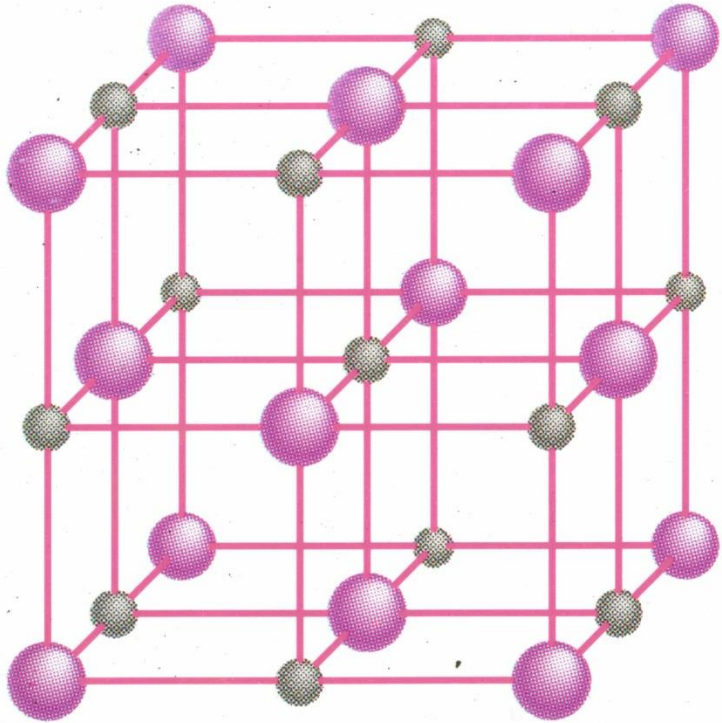
Ionic Compounds or Salts:

Ionic compounds or salts consist of a mixture of cations and anions that are electrostatically attracted to one another.

Consider table salt or NaCl. Consists of Na⁺ and Cl⁻ ions.

Sodium Chloride(NaCl):

Table salt or NaCl consists of Na^+ and Cl^- ions.



Chemical Formulas:

chemical formula - An expression used to indicate the composition of ionic and molecular compounds.

molecular formula - A chemical formula for a molecular substance that gives the type and the number of atoms in a molecule of a substance.

Chemical Formulas:

empirical formula - A chemical formula for a compound that is written using the simplest whole-number ratio of atoms present in the compound.

Ex1: hydrogen peroxide



molecular formula



empirical formula

Ex2: rocket fuel



molecular formula



empirical formula

Naming Compounds:

Ionic:

Ionic compounds are made up of a cation and an anion.

When naming cations, the name of the element is stated followed by "ion".

Na⁺ sodium ion

Ca²⁺ calcium ion

Naming Compounds cont.:

If the ion can have more than one positive charge it is indicated by parenthesis.

Cu^{2+} copper(II) ion

Cu^{+} copper(I) ion

Polyatomic Cations

NH_4^{+} ammonium ion

Hg_2^{2+} mercury(I) ion

Anions:

Anions are named by dropping the end of the name and adding the ending "ide".

Cl^- chloride

S^{2-} sulfide

O^{2-} oxide

Polyatomic Anions:

CN⁻	cyanide ion
OH⁻	hydroxide ion
O₂²⁻	peroxide ion
C₂H₃O₂⁻	acetate ion
NO₃⁻	nitrate
NO₂⁻	nitrite
SO₄²⁻	sulfate
SO₃²⁻	sulfite
CO₃²⁻	carbonate

Naming Ionic Compounds:

When naming ionic compounds the cation is stated first followed by the anion.

Compound	Name
NaCl	Sodium chloride
CaCO₃	Calcium carbonate
Fe₂O₃	Iron(III) oxide
Cu(CN)₂	Copper(II) cyanide

Naming Molecular Compounds:

For binary molecules, same rules as ionic.

Use the following greek prefixes:

1 mono

2 di

3 tri

4 tetra

5 penta

6 hexa

Ex: CO carbon monoxide

CO₂ carbon dioxide

N₂O₄ dinitrogen tetroxide