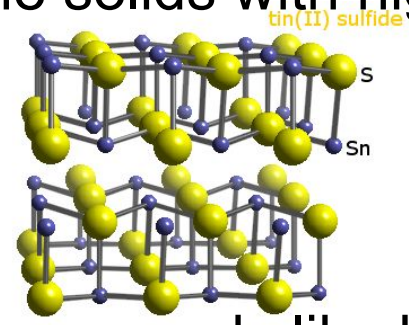
Molecular Compounds

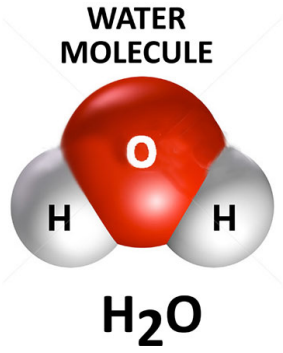
Ionic compounds, like tin(II) sulfide, make crystalline solids with high melting points.

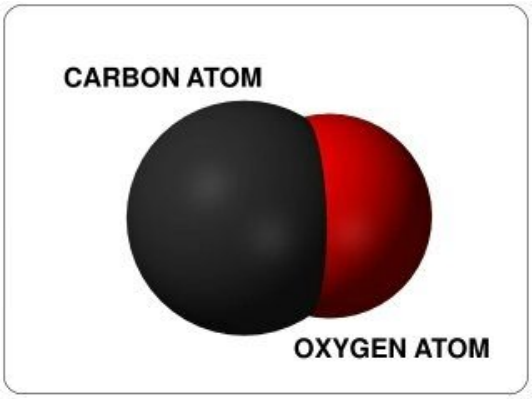


Other compounds like hydrogen chloride (gas at room temp.) or water (liquid at room temp.) have very different properties

In these examples, the attractions between cation and anion do not explain their bonding.

Instead, the atoms are held together by *sharing* electrons in a **covalent bond**. This is an attraction between 2 atoms that are sharing electrons.





Some elements found in nature are in the form of molecules. A **molecule** is a neutral group of atoms joined together by covalent bonds.

Diatomic molecules are molecules that only have two atoms.

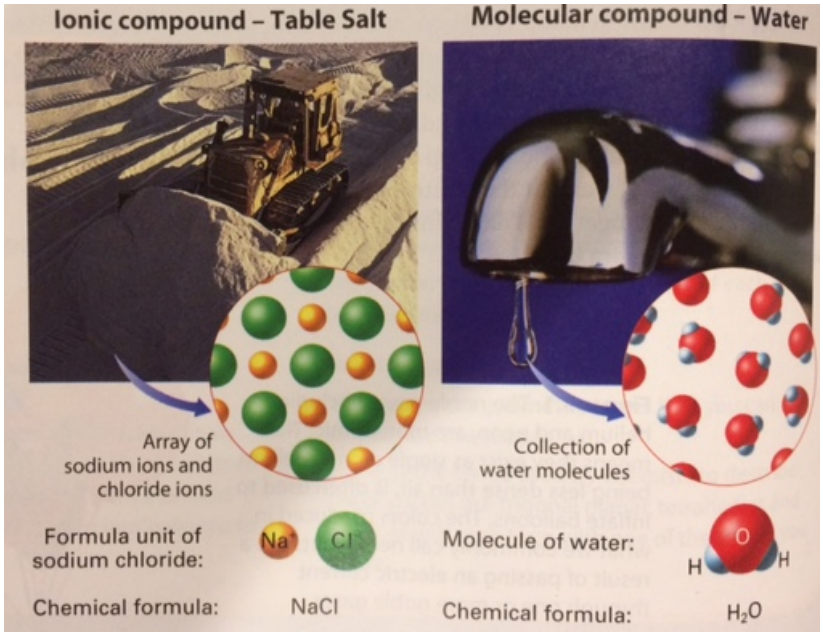
There are 7 elements that exist as diatomic molecules: I, H, N, Br, O, Cl, F

A compound composed of molecules is called a **molecular compound.**

Molecular compounds tend to have relatively lower melting and boiling points than ionic compounds.

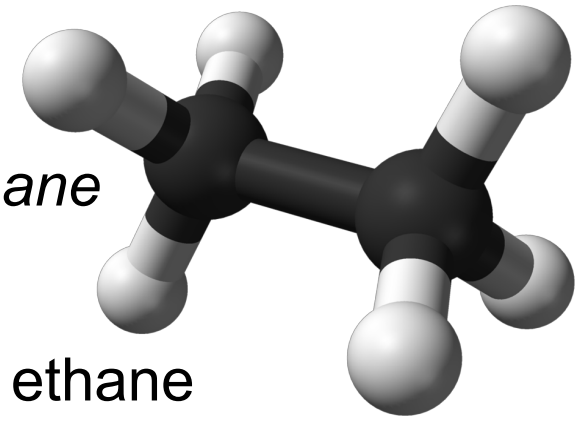
Covalent bonds are not as strong as ionic bonds. Positive charges pulling negative charges is much stronger than sharing electrons.

Reminder: There is no such thing as a 'molecule' of sodium chloride. Table salt exists as ions arranged in repeating 3 dimensional patterns. These patterns go for all ionic compounds.



A **molecular formula** is the chemical formula of a molecular compound.

A molecular formula shows how many atoms of each element a molecule contains.



For example, an *ethane* molecule is C_2H_6

So, one molecule of ethane consists of 2 atoms of carbon and 6 atoms of hydrogen.

Note that it does not need to be in lowest whole-number ratios.

To understand the behavior (properties) of molecular compounds, it is important to understand their molecular shapes - arrangements of atoms in the molecule.

Two common models or diagrams to predict and show shapes are:

1. Electron dot diagrams
2. Structural diagrams (lines show the bonds)

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